MANAGING THE BENEFITS OF EXECUTIVE INFORMATION SYSTEMS IN THE PUBLIC SERVICE.

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ABSTRACT

Although investment in IT is growing rapidly, a number of studies have shown that the full benefits of this technology are not realised. One explanation is that these benefits exist, but have not been correctly measured. The other explanation is that they have not been achieved because of lack of management attention. Experience and common sense supports the latter assumption. Hence, the aim of this research is to develop and to trial a method which assists in the realisation of the benefits of a particularly problematic technology, executive information systems (EIS).

The proposed method introduces the concept of generic benefits models into previous research on IT benefits management. This construct improves existing methods of benefits management in three respects. First, it employs reuse of benefits models in order to speed their development. Secondly, it allows these methods to be employed at any stage of a project, not just at the outset, in order to extract benefits. Thirdly, it provides a conceptual object which serves as the focus of organisational learning.

The major focus of the research is on the development of generic benefits models of EIS. This requires an understanding of the role which information plays in executive work and how EIS technology may affect the manner in which executives use information. Unfortunately, the literature on executive work does not make this clear. Moreover, it seems that there is no agreed definition of EIS. As a result, it is necessary to create different generic models for different theories of executive work and different forms of EIS.

The methodological approach adopted is pragmatism, in particular the experimentalism proposed by John Dewey and implemented by Donald Schön. The justification for this is that the primary objective of the study is to demonstrate the utility of the proposed method rather than its ability to explain, predict, or provide insight.

The study includes six experiments conducted within the office of the Malaysian Prime Minister. Different types of EIS, with different degrees of benefits already realised, and at different stages of development are the subjects of these experiments. The results largely
affirm the proposed method, but they do suggest some refinement of the original benefits models. They also indicate simplification of the models is possible. In addition the executives who participated in these experiments favour the proposed method. However, the IS practitioners in the organisation are less enthusiastic. The study proposes a solution to this problem which includes both changes to organisational structure and to the education of IS practitioners.

The research also produced a number of supplementary findings. It reaffirmed the findings of Mintzberg’s study of executive work. It demonstrated once again that executives rarely use EIS directly and that they mostly depended on subordinates to access information. When executives do employ EIS themselves, they are more likely to use it to enhance their learning than to support decision-making.
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CHAPTER 1:

BENEFITS MANAGEMENT

1.1 Introduction

Information technology (IT) investment is highly visible in modern organisations. The investment has been great both in developed and developing economies. Roach (1987) has pointed out that IT often accounts for a quarter or more of a firm’s capital stock. Esther and Brooke (1995) have reported that in the United States IT outlay represented 2.7% of corporate revenue. In the United Kingdom IT expenditure exceeded £10 billion, approximately 1.2% of firms’ annual turnover, increasing in 1993 to more than £12 billion, approximately 1.5% of turnover (Willcocks, 1994). In Japan IT investment in 1990 was 7.5% of total investment (Kraemer and Dedrick, 1994). For less developed countries IT investment has also been substantial. IT investment in Malaysia was 2.7% of all total investment in 1990 with an average growth of 10.8% from 1983 to 1990 (Kraemer and Dedrick, 1994). In Thailand IT investment was 1.52% of all total investment in 1990 and the average growth in expenditure from 1983 to 1990 was 25% (Kraemer and Dedrick, 1994).

With these large and growing investments, IT should provide many benefits to organisations. Generally, IT benefits should take the form of increased productivity, improved decision-making and increased competitive advantage. Improving productivity has always been an important justification for IT. Economists define productivity growth as getting more output from a given level of inputs. A ceteris paribus increase in the value of output arising from an incremental increase in IT defines the productivity of IT capital (Loveman, 1994). Improving productivity allows for increased profits by means of greater volumes or reduced costs. Hence, productivity growth is a constant concern of firms and many non-profit organisations as well.

Decision-makers need information in order to identify problems as quickly as possible and to understand the context of these problems. They need to be able to search for solutions and to evaluate the alternatives identified. IT may make available a larger volume of data
which is pertinent, more timely, and less prone to error than earlier administrative systems. Management information systems, decision support systems, and executive information systems are several means of using IT to assist decision-makers in government and in industry.

Competitive advantage arises from distinctive capabilities or strategic assets belonging to a firm. These features allow a firm which possesses them to add and to appropriate more value than is usual in their industry (Kay, 1993). IT may help a firm to create global markets for its goods or implement radical production strategies such as mass customisation (Pine, 1993). On the other hand IT may lead companies to create electronic markets for their goods, a strategic asset (Malone, Yates and Benjamin, 1994), which makes it difficult for their customers to purchase from competitors.

1.2 Problems of IT Investment

Few of these benefits seem to have been realised despite the large investment in IT. In fact there is still considerable uncertainty, even concern, about the impact of IT on organisations. Research shows that productivity gains in the aggregate economy attributable to IT have been limited. There are only a few studies which show that IT does have a positive impact on productivity. Brynjolfsson and Hitt (1993) have found a return on investment of 54.2% for computer investments, compared to 4.1% for all other investments. They have studied 380 of the 500 largest US companies from 1987 to 1991. Bresnahan (1986), in studying the gains from the use of IT in the financial sector from 1958 to 1972, has concluded that the gain to consumers was five or more times the expenditures spent by the financial firms on computer rentals. However, these studies are exceptions.

In the US productivity growth slowed in the 1970s and 1980s compared to the earlier post-war years even though IT investment grew largely (Baily, 1986). Roach (1989) has concluded that in spite of owning over 80% of America's information technology, the productivity performance of the service sector is "abysmal". Similarly, Baily and Chakrabarti (1988) who have studied the relationship between white-collar productivity and IT investment, as part of their inquiry into low productivity growth, have found no
evidence that IT significantly affects productivity growth. Loveman (1994) has examined the impact of IT on manufacturing productivity both in North America and Europe using data for the period 1978-1984. He has identified no significant effect. His results have indicated that the marginal dollar would best have been spent in other ways.

In the area of decision making there are a few cases where IT has been successful. For example, studies by Leidner (1996) and Leidner and Elam (1995) have shown how executive information systems have increased the speed of decision making and the widening of analysis. However, there are many decision support systems, which have not achieved their goals. One example is the Computerised Rural Information Systems Project in India (Griffiths and Willcocks, 1995). The Indian government built the system to assist in the administration of the allocation of resources to the rural poor. However, local administrators have never fully utilised it. Consequently, it is now seen as a large-scale failure.

Stories of companies which gained an advantage from prudent IT investment abound on MBA courses. Otis Elevator (Harvard Business School, 1985), Frito-Lay (Harvard Business School, 1988), Benetton (Harvard Business School, 1987), - these are some of the names to those familiar with this literature. A more wide-ranging investigation reveals a less rosy picture.

Copeland's and McKenney's (1988) history of customer reservation systems within the American civil aviation industry is an example. They have found that the airlines that were first to offer electronic markets did not gain advantage automatically. Rather the success of American and United Airlines depended on gaining market share rapidly, having strong technical expertise, and intelligent persistence. Clemons' (1991), in his study of the American pharmaceutical company McKesson has suggested that a more likely fate is that any benefits of an electronic market will be competed away in a price war which ensues. Clemons has concluded that the rewards of IT are, at least, as difficult to sustain as more traditional innovations. Vitale (1986) has put this view provocatively when he writes that the greater risk is not that the enthusiastic employment of IT will fail, but that it will succeed.
In fact the reality seems to be that many IT projects fail. Estimates of low IS success rates are plentiful in the literature. Lytinen and Hirschheim (1987) have estimated that as many as 50% of IS projects end in failure. Wilcocks and Lester (1993) have judged that IS success rates are no more than 30% - 40%. Remenyi and Schambreeel (1997) have referred to a BBC documentary which concluded that abandoned IT projects in British government had cost the tax payers £5 billion between 1982 and 1994. Similarly, Griffiths and Wilcocks (1995,p.103) have written, “Most major IT projects collapse after a considerable waste of resources, effort and misdirected funding.”

It is little wonder that senior managers are increasingly seeking evidence that IS can contribute to the success of the business. Grindley (1991) has pointed to the frustrations of Sir Denys Henderson, former Chairman of ICI, who has written “I still worry enormously, both about the amount we spent on IT and the increasing difficulty of justifying that expense in terms of the bottom line.” However, Strassman (1990) has demonstrated that there is no simple correlation between an investment in IT and an organisation’s financial performance. Direct correlation is difficult to find because in most cases IT is not a single, independent variable capable of directly affecting a firm’s profitability. IT investments may contribute to such profitability, but they interact with the other factors as Strassman has written:

The influence of computers on organisational behaviour and financial performance involves more aspects of a firm’s well being than any other technology, but that effect is indirect and subtle. Opinions on simple profit ratios composed of only a few variables do not yield useful insights into how to manage information technology resources for greater profitability. Financial analysts’ attempts to evaluate and control computer expenditures by means of a few simple ratios cannot succeed. (Strassman, 1990,p.54).

Therefore, IT may be useful to organisations, but it is very difficult to isolate its impact from that of other effects.
1.3 Possible explanations

Researchers have proposed several possible reasons for this IT performance paradox, for example Baily and Chakrabarti (1988), Brynjolfsson (1993), and Loveman (1994). These researchers believe that IT does have significant impacts on organisations, however these benefits are not observed due to the following reasons:

i. inadequate data
ii. time lag
iii. data restricted temporally to recessionary periods
iv. data restricted to developed countries
v. lack of measurement tools especially for intangible benefits
vi. redistribution of benefit
vii. mismanagement.

Loveman (1994) has argued that the sample used in his study is not representative in that it only includes manufacturing firms and ignores industries such as financial services, for which there may have been substantial returns. He has quoted Roach (1987), who states that less than 20% of the US IT capital stock resides in manufacturing. Most of it is in sectors such as finance, communications, insurance and service. Hence, Loveman has emphasised that the negative result in manufacturing should not be generalised. However, his argument is unacceptable as there is no reason why IT should have little influence in manufacturing. Manufacturing does have administrative components which should be affected by IT.

There is no evidence that IT improves productivity growth in other sectors. Strassman (1990) has found that there was no correlation between IT and return on investment in a sample of 38 service sector firms. He has concluded that there is no relation between spending for computers, profits and productivity. Roach (1989) has given similar findings on his research of white-collar productivity. Brynjolfsson (1993) has cited studies done in the financial sector by Parsons, Gottlieb and Denny (1990) and another by Franke (1987) which show that the impact of IT on productivity was quite low.
Brynjolfsson (1993) has argued that new technologies require learning and organisational changes in order to achieve potential benefits. Therefore, there is likely to be a lag between the time of investment and the time that benefits show up in productivity gains while organisations learn to manage IT and make necessary adjustments in management practices and incentives. This suggests that what is needed is a longer time frame. However, most of the study periods were more than five years. These are reasonably long and some productivity gains should surely have shown up.

Loveman (1994) has argued that the negative result of IT use in his study reflects a recessionary period. Although the reasons may be true to a certain extent, it however does not explain why IT productivity is still a question after the study period.

Roach (1989) and Loveman (1994), have both used statistics from the US Departments of Labour and of Commerce. Hochstrasser and Griffiths (1991) have used statistics from the UK. The suggestion is that if data were to be taken from other countries, some productivity growth might be observed. However, it seems more plausible that developed countries would be more effective at using IT than developing ones. There are many cases which tell the same negative stories from the developing countries. One such example is the Computerised Rural Information Systems Project in India (Griffiths and Willcocks, 1995) mentioned earlier. In South Africa Remenyi (1996) has written that nearly 30% of IS projects are abandoned before completion and 10% of IS developed were not ever used.

Baily and Chakrabarti (1988), Brynjolfsson (1993), McKeen and Smith (1993) and Loveman (1988) have lamented the lack of appropriate research tools. They have argued that intangible benefits such as improved quality of products, services or decisions are not captured. Brynjolfsson (1993) has claimed that productivity measures fail to account for gains such as better product quality and variety or the availability of new services. He has cited, “the types of benefits managers attribute to IT - increased quality, variety, customer service, speed and responsiveness - are precisely the aspects of output measurement that are poorly accounted for in productivity statistics” (Brynjolfsson, 1993,p.74). Looking into office productivity Panko (1991) has argued that productivity is difficult to measure.
in general. Hence, it is not possible to prove that productivity has not been increased with IT investment. Furthermore, part of the value of IT is that it allows businesses to be more flexible and to innovate, rather than just reducing costs or increasing output. Financial methods based only on quantitative data are inappropriate for treating benefits which are less tangible. Intangible benefits may be extensive but unmeasurable.

Another possible reason is that IT might just redistribute the output, not increasing it, benefiting individual firms, but not the economy as a whole. Here, Baily and Chakrabarti (1988) have written that IT is used as a marketing tool to redistribute among competitors a fixed level of output. Hence, there will only be private gains, but as a whole there will be none. Similarly, Brynjolfsson has argued that firms invest in IT to gain competitive advantage or to meet competitive standards, but that investment does not increase overall output. Clemon's (1991) study of McKesson has concluded that the creation of an electronic market has reduced its costs, but the benefits have been competed away. As a result, McKesson's competitive position is unchanged.

These six explanations assume that IT benefits exist but are currently invisible. Taking these explanations, if there were better data or if the study period were longer or if there were appropriate measures, then we would be able to observe benefits. However, the seventh explanation for the paradox argues that IT benefits have not occurred because of mismanagement. Jurison (1994, p. 248) has stated, "IT benefits depend to a large degree not on the size of the investment, but on management effectiveness in converting the investment into business results." Strassman (1990) has firmly suggested that the business value of computers comes from the people who manage and use them. Both Loveman and Brynjolfsson have argued that the absence of significant productivity growth associated with IT is due largely to management. Managers educated in an earlier era do not understand how to build organisations that effectively integrate IT with business strategy, human resource management and efficient resource allocation. They cannot capture the productivity gains because they do not reduce other expenses that IT facilitates. This is because benefits of IS are not identified and or managed. Their argument is that, if the IT investment is not managed with specific benefits in mind, then no benefit will be realised. Organisations will obtain the benefit of IT only when there is
a formal procedure in place to manage them. Some authors have proposed methods of benefits management to address this problem.

### 1.4 Importance of Benefits Management

Benefits management approaches advocate the need to identify the expected benefits of any IT investment to stakeholders from the beginning of the project. They seek to ensure that stakeholders take responsibility for the realisation of these benefits and that at the end of the project they are held accountable for the achievement of these benefits. These methods seek to eliminate the confusion surrounding the success or failure of an IT investment. Unfortunately, many organisations employ no formal procedures for managing benefits. For example, a survey by Price Waterhouse, an international management consultancy has indicated that 50% of organisations surveyed had no system of benefits management.

With increasing expenditure on IT investments and the low success rates of their implementation, it is strongly felt that there is a need for the management of IT benefits. The value in studying the process, as Farbey et al (1993,p.10) have written, “is not just being able to say yes or no with greater discrimination,” but it provides the driving force for successful implementation. They have argued that without an evaluation of the benefits a new system should yield, it is not possible to reap the benefits. They have stated, “A lack of awareness of different types and levels of benefit can lead to an incomplete realisation of the full, potential benefit of a system” (p.24). Similarly, Lincoln (1990,p.325) has written, “Unless a deliberate and systematic effort is made to plan and manage benefit achievement these wishes are likely to remain unfulfilled.” Symons (1994,p.253) has concluded; “Successful utilisation is by no means automatic. Appraisal of costs and benefits is necessary if value for money is to be obtained from existing information systems and plans made for future applications.” Norris (1996) has cited a survey conducted for the Institute of Chartered Accountants on the most common causes of project failure. Among the top ten causes of failure the survey found that vague statement of benefits, leading to an uncertain allocation of responsibility for managing their delivery is the number one cause of failure. Bacon (1992) has proposed that more accurate quantification of costs and benefits and more informed IT investment decisions
are more likely to occur where there is effective benefit-tracking. His findings summarise the practice and experience of 80 companies which participated in his survey.

Remenyi et al. (1991) have given the risk factor in IT investments as one of the major reasons for the necessity to focus on benefits management. There are a number of dimensions to IT risk. These include structure of project, size of project, organisation’s failure record, as well as novelty of technology and project. Ward and Murray (1997) have suggested that the biggest risk in an IT project is that the system will not deliver the desired benefits.

Blackler and Brown (1988) have written that the pervasiveness of the technology and the growing realisation that successful use is not automatic may lead to an increased awareness of the importance of a systematic evaluation of IT applications. Benefits of IT do not manage themselves, they have to be actively managed. Thus, one needs a method to manage the delivery of benefits, to ensure that promises are fulfilled and that variances are tracked throughout the life of the investment (Leyton, 1995).

1.5 Absence of Benefits Management.

Even though many authors have argued that benefits management is necessary in increasing the probability of success for IS projects, it is often ignored or carried out inefficiently or ineffectively. From a survey of fifty UK organisations, Ward and Taylor have concluded:

> Very few organisations use a benefits management process to complement their systems development, project management and investment appraisal processes. In most cases, all that exists is some set of techniques to examine potential benefits, sufficient for an investment justification to be produced and perhaps a review process after the project is complete to determine whether or not benefits were achieved (1995, p.6).

Farbey et al. (1993, preface) have quoted Wilson who has written, “We cost justify new systems on the basis of lies, and having justified them on the basis of lies and overstatement, we then don’t measure the true business value.” Much of it is done so as
to get an approval to go ahead, as Powell (1992, p. 40) has written; “IT justification is a ritual of legitimacy not an attempt at really assessing benefit.” Organisations rarely emphasise the delivery of benefits. Galliers has written that organisations seldom identify benefits systematically; “It is often the case that there is an absence of agreement as to what the IT investment is actually supposed to achieve in business terms, let alone adequate procedures by which such benefits may be identified and or measured.” (Galliers, 1995, p. 6).

It is normally assumed that the claimed benefits will flow as planned for the duly implemented systems. To this effect Remenyi et al. (1991, p. 33) have written; “There seems to be an implied assumption that benefits are passively produced although costs are actively controlled.”

Farbey et al. (1992) have observed that only 50% of projects which they examined were subject to formal pre-investment appraisal. In less than half the cases, a recognised financial analysis technique used, and in barely 30% was the outcome of the investment evaluated. Leyton (1995) has cited a Price Waterhouse survey in 1992 which revealed that almost 50% of organisations in their survey had no system of evaluating their IT investments. Hoschstrasser and Griffiths (1991) have found that 84% of companies invest in IT without using systematic methods to calculate either the costs or benefits of the investments. Willcocks and Lester (1996) have found that from 50 companies which they have investigated, only 66% completed their evaluation at all stages of the system life cycle. Hares and Royle (1994) have found that 60% of managers in the UK decide to invest in computer systems on a “gut feel” basis, with the view that these investments are good and it is the way the world is going. Looking at the whole lifecycle of benefits management, the situation is even worse. A survey of 60 IT managers in UK private companies (Ward et al., 1996) found that only 5% of the companies had any kind of rigorous or formal practice of benefits management. 86% of the respondents to this survey said that it was not possible to anticipate benefits. The main reason that the benefits are identified and quantified is to gain project approval. However, once this “hurdle” has been overcome, no one pays further attention to benefits, and they expend effort on technical implementation (Murray and Dhillon, 1997).
Remenyi et al. (1991), Blackler and Brown (1988), Willcocks and Lester (1993) have suggested some reasons for this lack of IT benefits management. These reasons are:

i. the users are not sufficiently involved in project
ii. the IS group moves to another project
iii. the benefits will take care of themselves
iv. the system takes too long to develop
v. the managers consider benefits management problematic
vi. the investment in IT is necessary
vii. the low costs and low risks projects do not merit such techniques
viii. the working system is sufficient.

Remenyi et al. (1991) have suggested that benefits management is not actively pursued because control of the project is invariably handed over to users too busy or not sufficiently involved with the project to ensure that the benefits are actually delivered. There is, however, little evidence to suggest that users are allowed to manage projects.

Completed projects seldom have a final appraisal since the IS group moves to a new project. Parker et al. (1988) have attributed this attitude to an urgency to get on with the job. The finished project will only attract attention when there are problems with it (Remenyi et al. 1991).

Blackler and Brown (1988) have made another observation. They have noted that the characteristics of policy initiatives in the United Kingdom have been based on assumptions that the use of these technologies will automatically lead to benefits for organisations. Such an approach carries with it the implication that careful appraisal and evaluation of impacts is not essential. The evidence suggests this assumption is insupportable.

Blackler and Brown (1988), have also suggested that organisations probably do not undertake post project evaluation due to the lengthy period of the system development.
New issues may demand their attention by then. An organisation's lack of appropriate disciplines of monitoring IT projects may exacerbate this (Parker et al. 1988).

Many organisations also do not perform benefits management as it is both conceptually and operationally difficult (Willcocks and Lester, 1993). Moreover, the methods available may not be completely adequate in all situations (Farbey et al. 1993). Many organisations also feel investment appraisal has proved to be more problematic for IT than for many other types of investments (Hares and Royle, 1994). The intangible benefits of IT are difficult to identify, measure and value. It is also hard to put boundaries around IT projects (Hares and Royle, 1994; Farbey et al., 1993) as IT often influences many areas of a business. It is not easy to allocate costs and hence the net benefits. The cross functional impacts and interactions can be difficult to anticipate or predict, making appraisal ambiguous. King and Schrems (1978) have written on the problems of accurately estimating benefits from proposed systems in multi-user environments and the perplexities of intangible benefits. They have also highlighted the problems of performing cost-benefit analysis in public agencies showing that the special characteristics of the public sector tend to magnify the problems inherent in cost-benefit analysis. Many organisations which make use of benefits management do not feel satisfied with the methods they use. The processes may not reveal the "softer" benefits and the impact which the system may have. In their survey Ward et al. (1996) have found that 60% of their respondents believe that their current project justification process fails to identify all available benefits. 47% have admitted that their current process actually overstated the benefits in order to get approval.

Hares and Royle (1994) and Remenyi et al. (1991) have also suggested that some organisations do not feel the need for any pre project evaluation since the computer system is a prerequisite for doing business, a strategic necessity (Clemons, 1991). Many of these organisations have argued that IT is clearly a basic requirement for business that it is unnecessary to perform regular benefit analysis. They have given the examples of accounting and payroll systems and airline booking systems as competitive necessities. Powell has observed, "computerisation is seen in some instances as obligatory or strategic. 'Strategic' is the new defensive avoidance term ....Anything labelled as strategic
bypasses the normal review process” (Powell, 1992, p. 37). However, even for “must have systems”, it is important to identify the potential beneficiaries and the risks involved (Farbey et al., 1993).

Low cost and low risk projects are also sometimes a barrier to proper IT investment appraisal (Hares and Royle, 1994). The introduction of small application packages such as word processing or spreadsheets may not make organisations feel the need to justify and to monitor their impact.

Symons (1993), focusing on post-implementation evaluation, has suggested that the evaluation is rarely carried out as there is, “the feeling that a working system is sufficient reward in itself” (p. 51). Post-project evaluation is thought to be unproductive and there is the risk that it might reveal non-cost effective results.

These arguments may be reasons for not undertaking benefits management, but they are not a justification. To Hares and Royle (1994) they indicate “a sorry state of affairs” both in the techniques of valuation and in the attitude of managers. They have written; “it is probable that the attitude aspect is in large measure the result of the absence of adequate techniques for full project valuation. Inadequate investment appraisal techniques have been the cause and the effect has been management cynicism” (p. 24). They, therefore, have claimed that the major cause of all the current problems with IS project assessment is the absence of a comprehensive method of investment appraisal and justification.

1.6 What is benefits management?
Ward et al. (1995) have defined benefits management as “the process of organising and managing such that potential benefits arising from the use of IT are actually realised”. In other words benefits management involves the complete process i.e. the procedure by which the benefits from potential investment are identified, realised in practice during the project, and evaluated after implementation to determine whether the objectives that have been set out in the beginning have been met. It is more than a one-off evaluation exercise. The benefits management approach recognises that pre and post project evaluations alone are not sufficient. Ward et al. have written:
Although improved investment appraisal techniques are likely to improve the decision making process for IS/IT investments, on their own they are unlikely to ensure that the benefits claimed for those investments are realised. Post-implementation evaluations, if focused on benefits delivery issues, could enable better judgement of the potential benefits which are actually achievable within an organisation, and the feasibility of achieving them. But both to increase the realisable benefits requires a more comprehensive process. This process runs throughout the system lifecycle and complements existing systems, project and appraisal techniques. Perhaps in the longer term, a benefits management process should be the core process around which the other methodologies have to fit successfully (Ward et al. 1996,p.224).

Organisations always develop IS with the objective of gaining benefits. However, information systems offer only the potential of benefits (Ward et al. 1995). In order to take advantage of these benefit opportunities, changes must take place in the way that business perform these constituent activities. Benefits, therefore, arise from changes. Zuboff (1988), for example, has argued that the greatest benefits do not arise from replacing human intellect by machines, but by using information to improve the way that business is done. Ward et al. have concluded:

If benefits are derived from IS/IT through business changes, then it is reasonable to assume that it is implications of these changes which must be assessed pre-project in order to quantify the potential benefits. Also it is the effects of these changes which must be measured and evaluated post-project in order to determine if the desired benefits have been achieved in practice. (Ward et al. 1996, p. 216).

A critical part of the benefits management approach is to define the set of benefits, the changes needed to realise these benefits, and the stakeholders responsible for the creation of the benefits. Hence, the expected benefits become the focus. In the days when most IT was used to automate basic processes, benefits were relatively easy to specify and to measure, for example, two payroll clerks replaced by a small business computer. However, now organisations' basic processes are largely automated. A growing proportion of new IT investment aims to support applications which attempt to informate
an organisation for example executive information systems. They have benefits which are not only difficult to measure but are also difficult to describe in advance (Remenyi, et al. 1991). These benefits may be potentially much larger than those delivered by automation projects. Managers, who are accustomed only to financial based approvals, may feel uncomfortable with the intangible benefits claimed for such systems. However, whilst it may well be difficult to put strict monetary values to them, these potential benefits are very real, may be very important to the firm’s profitability, and certainly need to be managed.

1.7 Components of benefits management
A process model of benefits management has been developed within the Cranfield research programme as shown in Figure 1.1.
The figure shows five phases in the process of benefits management. These can be summarised into three main phases, the justification phase, the realisation phase and the post-project evaluation phase.

The justification phase consists of two main activities: identifying and structuring benefits and planning benefits realisation. It involves the identification of benefits, measuring the benefits with the resources needed to achieve them and assessing the possibility of risks that may be involved. Here, analysts identified the proposed benefits in order to make known their rationale and their location in the organisation. They must structure the benefits so as to understand the linkages between the technology effects, the organisational changes and the organisational objectives. This allows the value of the benefit to be appraised and the individuals affected to be identified. For each proposed benefit, the analyst develops measures. Planning benefits realisation involves the planning of how each proposed benefit will be achieved and specifying responsibility for ensuring that these benefits are realised. At this stage the projected costs and benefits of the project can be determined.

The realisation phase consists of the execution of the benefits realisation plan. Here a project team makes the necessary changes to realise the proposed benefits.

The evaluation stage consists of two components: evaluating and reviewing results and potential for further benefits. At this stage the team uses the previously developed measures to evaluate the effects. As Ward and Murray (1997, p. 17) have written, “Review is not of the project progress, but of the realisation of benefits.” The team must identify any variance between benefits planned and achieved. Although other potential benefits can be identified at any time, they are most likely to be uncovered at this stage.

Appendix 1.1 summarised the process of benefits management as proposed by Ward et al. (1995, 1997).
1.7.1 Justification Phase

1.7.1.1 Identifying and structuring benefits

The process of benefits identification is relatively easier for systems which have tangible benefits. Quantitative benefits directly reduce cost or increase revenue. Staff reduction typifies such benefits. These benefits are easily identified, measured and verified. But benefits such as improved decision making and better organisational co-ordination are not easily quantifiable.

Some of the methods used to identify such benefits include focus groups, in-depth interviews, expert opinion, the Delphi technique, observation, benefit profile charts and existing systems review (Rivard and Kaiser, 1989). Focus groups normally consist of eight to ten people helping to identify benefits of a system. An analyst who acts as moderator leads the discussion. Unlike focus groups, in-depth interviews provide detailed thoughts and opinions of an individual rather than the general opinions of a group. Both expert opinion and the Delphi technique are useful when little or no data exists to assess the impact of future events. Expert opinion relies on interviews or surveys of experts to derive the major viewpoints. The Delphi method surveys experts regarding the probability of occurrences and their likely effects. Analysts compute survey results and experts review them independently and revise them accordingly until the group reaches consensus. The Delphi method attempts to reduce bias that occurs during face-to-face interviews or group discussions. Observation familiarises analysts with user environments, allowing them to visualise the system's interaction with user functions and formulate some possible benefits. However, it has the disadvantage of not providing any insight into the cognitive processes involved in the observed work. A benefit profile chart describes a comprehensive list of various benefits, such as greater reliability, more concise information, easier access and improved decision making among other things. This helps in assuring that no significant benefits have been overlooked. Ward et al (1997) have proposed the study of business objectives and the identification of areas where benefits will occur as the major steps in benefits identification. Analysts may explore likely benefits through workshops and brainstorming sessions. They have suggested Information Economics, top down modelling, and bottom up modelling as possible techniques to explore potential benefits. Then they link the proposed benefits to
the business objectives and IT capabilities. They have called this process benefits structuring. The objective is to map out the intermediate outcomes that have to be met in order to gain the overall benefits.

No single method is best for all situations, but a combination may capitalises on the advantages of several. Rivard and Kaiser (1989) have listed a few issues which should be considered when identifying benefits. These include analysing users' critical success factors (CSFs) as a means of identifying potential benefits. Considering the multiple user perspectives is also important as people at different levels and departments within an organisation have different sets of CSFs. Another factor mentioned is explicitness. Explicit identification is necessary. For example, improved decision making has little value for management unless: the decisions affected are identified; the decision processes are explained; the possible results clearly stated. Successful benefit presentation also depends upon explicitly documenting the assumptions that were made during benefit identification, allowing others to evaluate the degree of subjectivity involved. To Ward et al. (1997) the main output from this stage is a "Benefits Statement". It contains the project overview, benefits dependency network, proposed benefits, potential risks and any potential negative outcomes.

1.7.1.2 Planning benefits realisation

The main objectives of this step are to produce a plan to realise the project’s benefits and to assess the project’s costs. An analysis should reveal necessary changes and risks. This leads to a plan detailing the timing of the constituent activities. Those responsible for making the changes must agree to the plan. With all these details, it is possible to perform a full costs and benefits analysis of the project. The output from this stage is a "Benefits Realisation Plan". A somewhat similar idea is the business value engineering promoted by Cotten and Hogbin (1995). They have claimed that business value engineering refines the way in which the purpose of a project is defined, keeps that purpose at the forefront throughout the development and confirms that the purpose is achieved. It integrates benefit delivery activities with the total project plan. The technique’s major deliverable is the value linkage diagram which documents the cause and effect chain that link project
activities to desired benefits. It also produces the benefits profile document describing the benefit, the people responsible for it and how it is to be realised.

Ward et al. (1997) have proposed the use of this benefits realisation plan together with the benefits statement produced under the identification stage as the supporting documents for project justification. However, some of the techniques used such as Cost Benefit Analysis (CBA) (King and Schrems, 1978) have also been recognised as justification techniques in their own right.

In fact CBA has been one of the commonly suggested IS justification techniques. CBA originated in the field of public policy and has been used in both justification and evaluation. It uses standard accounting practices such as rate of return and time value of money to create monetary equivalents. Remenyi et al. (1991) have defined it as the process of comparing the various costs of acquiring and implementing an information system with the benefits which the organisation derives from the use of the system. CBA, if applied in cases where costs and benefits are easy to identify and quantify, has many advantages in terms of acceptability and comprehensibility. Managers must estimate the probabilities associated with the occurrence of possible consequences of implementing an application and attribute a monetary value to them. Costs and benefits are the monetary value of these events multiplied by the corresponding probability. A discount rate moderates the present value of costs and benefits which are expected to occur at some future time. The benefits total is subtracted from the costs total. This provides an index for ranking alternatives. There are critical assumptions which are usually buried in the computations and are open to abuse, for example, the choice of the discount rate. The determination of costs may be relatively straightforward, although Strassman (1985) has criticised the frequent failure in practice to include all the true costs. Comparatively, the calculation of benefits is fraught with difficulties (Land, 1976). The problem of accounting for qualitative benefits is usually overcome by attributing to them some quantitative value, treating them as a side issue or ignoring them altogether (Keen, 1975). It is because of all these that many writers have been critical of CBA. Tapscott (1982) has criticised CBA on the following grounds:
i. the frequently quoted benefit of increased productivity is problematic when there is no widely accepted theory or measure of office/management productivity;

ii. it is far from easy to predict reliably the exact impact of a new information system;

iii. savings in, for example, time, are not necessarily additive;

iv. it is difficult to show causality, i.e. to prove that a particular benefit is directly/solely due to the new information system.

There are also some cost accounting problems with this method as suggested by King and Schrems (1978). These are double counting, counting a secondary cost which is already included in the direct cost, omitting significant costs such as space and electricity and the problem of hidden costs such as assigning a share of overhead to a particular activity.

Besides this traditional approach of costs and benefits to IS justification, there are also other approaches based on the concepts of value and multi-criteria scoring. Multi-criteria scoring enables qualitative and quantitative IS benefits to be taken into account during economic justification. Information economics (IE) (Parker et al. 1988) is, perhaps, the best known example of a multi-criteria scoring method. IE provides a framework for appraising, in addition to the cost avoidance and labour savings, the extra benefits of an IS in terms of its contributions to value-linking (the additional benefits due to increased electronic integration), and value-restructuring (the benefits that accrue from the changes expected in organisation structure and work practices). IE allows selection between several IS projects to take place. IS project with a very bad CBA compared to other IS projects can be cast in a more favourable light with IE’s additional value, alignment and strategy scores. However IE does have its weaknesses. Quantifying a set of intangible benefits may be subjective. People differ in terms of what is considered most significant. The process is also open to misuse as the numbers can be manipulated to promote a personal agenda (Fidler and Rogerson, 1996).

Keen (1981) has promoted another justification method based on multi-criteria scoring. This is value analysis. This technique’s original aim was to aid cost and benefit assessments of decision support systems. It does not require each benefit and cost to be
quantified individually. Rather, it focuses attention on the overall worth of an IS project to the organisation.

In their taxonomy of evaluation methods, Farbey et al. (1994) have identified several methods for use in information systems justification. They have examined the methods in terms of the underlying approach or model, the audience, the complexity, the information requirements, and the people who should do the *ex ante* evaluation, for example, developers, users, or consultants.

1.7.2 Benefits Realisation

There is not much that has been written about benefits realisation compared to benefits justification and evaluation. Although under project management there are well established techniques to manage quality, risks and costs, techniques to manage the benefits of a project are poorly defined.

1.7.2.2 Executing the benefits realisation plan

The main purpose of this phase is to undertake the actions that have been laid out in the plan. The project team implements the required changes and introduces the new procedures. With the changes, education and training become important and staff may have to be redeployed.

Parallel operation for a short period or phased implementation may enhance the chances of success. As the project progresses, there will normally be alterations in the requirements and objectives. These will affect some of the benefits earlier identified. These benefit changes have to be monitored and accounted for in this phase. New plans have to be drafted to achieve these benefits.

1.7.3 Post Project Evaluation Phase

Looking at the literature on post implementation evaluation, there are various approaches that have been suggested. Many of them draw on the same techniques as benefits justification, only they are employed *post hoc* rather than *ex ante*. Therefore, the purpose is to use the techniques such as CBA to assess whether benefits have been realised rather
than to win approval for a new project. Strassman has more recently proposed the return-on-management method. This approach isolates the management added value and then divides this by the management cost. Strassman (1990) has argued that IT must be assessed by its impact on management since to him management is the key to a successful IS implementation. Management value added is the residue after every contribution to a firm's inputs is paid. If management value added is greater than management cost, then management efforts are productive in the sense that their outputs exceed their inputs. This approach attributes surplus value to management as it is based on the notion that in contemporary society, the scarcest resource is not capital, raw materials or technology, but rather good management. To Strassman good management makes all the difference between success and failure.

A straightforward evaluation method is a system's utilisation. The assumption is that the more a system is used, the more successful or effective it must be. Keen (1975) has criticised this by reasoning that the system may be the only means of doing the task. Other evaluation methods include benchmarking where organisations assess their performance by comparing themselves to other organisations. This is a difficult process and frequently relies on subjective evaluations involving ranking and scoring. Another ranking and scoring technique which has a high degree of subjectivity is the management vision approach (Hirschheim and Smithson, 1988). Managers assess the current systems in terms of what their original plans were. A similar method, strategic match analysis, requires the project to be assessed in terms of whether or not it supports the main strategies of the organisation. User attitudes may also serve as a measure of how a particular IS is performing. Surveys are the primary vehicle for this.

Ward et al. (1995, 1997) have divided the post-project evaluation into two stages beginning with the review of the project and subsequently evaluating the project for further benefits.

1.7.3.1 Evaluating and reviewing results
The objective of this phase is to evaluate the project so as to determine whether the proposed benefits have actually been delivered. Ward et al. (1997) have suggested the holding of benefits review meeting to discuss the outcomes of the project. The meeting
must include representatives of both business and IT who are involved in the project. The results of the meeting are documented as a "Benefits Review Report". It contains the overall outcome of the project, further actions needed to realise the benefits fully, and other necessary actions agreed at the meeting.

1.7.3.2 Potential for further benefits
At this stage, participants attempt to identify further potential benefits from the project. This may result in a new project or enhancement of the current project. Ward et al. (1997, p.41), have described this, "closing the loop in the benefits management process by going back to the identifying and structuring benefits stage." The main output of this final stage is a "Final Report". It contains lessons learned and necessary actions needed for the project and other future projects.

1.8 Summary
The chapter has assessed the impact of IT investment in general. It concludes that many IT investments do not produce their intended benefits. It then examines possible explanations of this outcome. Many of the proposed explanations assume that the benefits have been achieved but have not been correctly measured. The exception is the view that benefits are lost because of lack of management attention. A number of authors have proposed methods for managing benefits actively. The chapter concludes with a description of benefits management.

The research will use this technique of benefits management to look into a method of benefits realisation for executive information systems. The next chapter will examine the nature of work of the users of the system, the executives. It will examine the role of information in executive work before looking further into how each type of EIS might benefit executives.
CHAPTER 2:

NATURE OF EXECUTIVE WORK

2.1 Introduction
This chapter examines the concepts which underlay executive work. The discussion starts by defining who an executive is. It then looks into the development of the idea of executive work. A summary of relevant research is then developed to produce a model of executive work.

2.2 Who is an Executive?
There is no agreement on who is an executive. The word ‘executive’ itself is open to various interpretations. The word executive derives from the Latin *exsequi* which means to follow out. The *Oxford English Dictionary*, ascribes the first use of the word executive to Sir Thomas Browne in 1646 with the meaning “capable of performance, operative.” Some other meanings which it lists are, “active in execution, energetic”; “apt or skilful in execution”; “pertaining to execution, having the functions of executing or carrying into potential effect”. It also recognises the word executive to mean “the branch of the government which is concerned or charged with carrying out the laws, decrees and judicial sentences; opposed to ‘judicial’ and ‘legislative’.” The Oxford English Dictionary attributes the first use of the term specifically within a business context to G.H. Lorimer who used it in 1902 to mean, “a person holding an executive position in a business organisation; a person skilled in executive or administrative work; a business man.” (Oxford English Dictionary, 1989,p.522).

This definition offers a broad understanding of who an executive is. It is reminiscent of Drucker’s famous definition of an executive:

> Every knowledge worker in modern organisation is an executive if, by virtue of his position or knowledge, he is responsible for a contribution that materially affects the capacity of the organisation to perform and to obtain results. Such a person must make decisions; he cannot just carry out orders. He must take
responsibility for his contribution. And he is supposed, by virtue of his knowledge, to be better equipped to make the right decision than anyone else. (Drucker, 1970, p.5-6).

In Drucker’s definition anybody is an executive who has responsibility for the performance of the organisation. One might be able to infer from this that every employee is an executive in that each has some responsibility for an organisation’s performance. This interpretation would be unhelpful. It is clear that Drucker intends to number professionals, such as doctors, solicitors, and architects among the band of executives as well as managers and administrators.

This distinction between managers and professionals is more clearly made by Friend (1986) who has defined executives as those “responsible for the planning, control, and operation of departments, divisions, and entire corporations. They manage people and facilities and are responsible for business results” (p.31).

In this dissertation I shall use the term “executive” very specifically. Executives are that small group of senior managers in a self-standing organisation who have direct responsibility for its long-term survival.

Executives in this precise sense are distinguished from other managers by several characteristics. First, executives are the group of managers who occupy the top level of a hierarchy. For example, Scholefield (1968) has identified executives as the people at or near the top of the management hierarchy. Executives are directors of corporations, chief administrators in hospitals, vice-chancellors of universities and ministers and senior civil servants within governments. In this context the term ‘executive’ indicates not only a function, but often has connotations of status as well.

Secondly, executives are responsible for determining the strategic direction of their organisations. Senior managers have little control over the destinies of their firms when they are dependent on parent organisations. Anthony (1965), for instance, has described three levels of management planning and control. These are strategic planning,
management planning and control, and operational control. Strategic planning involves the process of determining the organisation's objectives, the resources needed to achieve them and the policies that govern the resources' acquisition and utilisation. Management planning and control assures that the resources are used effectively and efficiently to accomplish the organisation's objectives. Operational control requires that specific tasks are carried out effectively and efficiently. Every executive assumes each of these tasks. However, strategic planning is the most prominent. For example, the directors of a bank must plan for the survival of the bank; bank managers have no strategic responsibilities. Their organisation, the branch bank, is not an independent firm.

Thirdly, executives have power and authority which derives from their position in the hierarchy. Barnard has written "men impute authority to communications from superior positions" (Barnard, 1968, p. 173). According to him this "authority of position" is to a large extent independent of the personal ability of the holder of the position. The advice or opinion may be superior solely by reason of the advantage of position.

Fourthly, executives serve as an interface between their organisation and the outside world. Because of their status and their access to people outside of their organisations, Mintzberg has observed that an executive becomes the "focal point of his organisation for special external information." Likewise, he must represent his organisation with a variety of outside interests, such as stockholders, citizens or the church.

2.3 What do executives do?

Since writers seldom distinguish between managers and executives, there are few works which refer explicitly to executive work. The study of what managers do dates back to the early years of this century and has two major lines of inquiry.

The early writing enumerated the activities of managers. The authors were practising executives and early management consultants who wished to rationalise their experiences. Because of their own backgrounds, their focus was often more on the function of executives rather than shop floor supervisors. Scholars usually associate these views with the larger body of literature developed in the first half of the 20th Century.
which attempts to codify the principles of control within bureaucracies. Organisational theorists usually refer to these writings as the classical theory of management.

Since the Second World War academics have adopted an alternative approach to the study of managerial work. This depends on the direct observation of managers as they work. In most cases the subjects have been executives. This research, in addition to making claims of being more rigorous, hopes to understand how such factors as the environment and individual characteristics may affect the job of management. Of course, these investigations have also provided alternative enumerations of managerial functions.

It is significant that both these schools are empirically based. They have used experience and observation as their methods. The academics' work is arguably more rigorous and they have provided something more systematic. However, the result of these studies remains schemes of classification without the suggestion of any underpinning explanatory model.

2.3.1 The Classical view of executive work

Among the early writers of executive work is Henry Fayol who has been described as the father of the classical school. He was a mining engineer by training and spent his early working life as an engineer in the Commeny group of pits of the Commeny-Fourchambault Company. However, from his early thirties onwards he spent his working life in general management. He became the managing director and later the chief executive of the mining company. Based on his successful career in management he devoted the last years of his life in popularising his theory of administration. Fayol wrote several papers on administration and later a book which was translated into English with a title General and Industrial Management (Fayol, 1949). Management to Fayol is a very important function of high-ranking officials. Even though other workers such as foremen do have some management functions, the proportion of time spent is very much less and their most important ability would be technical instead of managerial. In comparing the various abilities of personnel in an organisation, Fayol has stated that a minister and a head of state would have 50%-60% managerial ability compared to 15% for a foreman. Therefore, management to Fayol is related more to top level officers.
Even though he did not call them executives, the management principles that he has advocated are more relevant for this group of people. The term manager that he used is synonymous with the term executive.

Fayol proposes five basic executive functions. These are:

i. Planning
ii. Organising
iii. Commanding
iv. Co-ordinating
v. Controlling

(Fayol, 1949).

Fayol has proposed five planks for his programme of management. First, he believed managing means looking ahead. This makes the process of forecasting and planning the central activity of executives. Executives must assess the future and make provision for it. They must ensure that the objectives of each part of the organisation are synchronised with one another. They must adapt plans when circumstances change and attempt to predict the courses of action accurately. The plan of action is the chief instrument:

The plan of action is, at one and the same time, the result envisaged, the line of action to be followed, the stages to go through, and methods to use. It is a kind of future picture wherein approximate events are outlined with some distinctness, whilst remote events appear progressively less distinct, and it entails the running of the business as foreseen and provided against over a definite period. (Fayol, 1949, p.43).

The second plank is organising. Fayol has defined this as, "...to define and set up the general structure of the enterprise with reference to its objective, its means of operation and its future course as determined by planning; ...It is to give form to the whole and to every detail its place; it is to make the frame and to fill it with its destined contents" (Gulick and Urwick, 1937, p.103). Here, executives have the task of building up an organisation which will allow the basic activities to be carried out in an optimal manner. Central to this, is a structure in which plans are efficiently prepared and carried out. There
must be unity of command and directions, clear definitions of responsibilities, and precise decision-making. There must also be a means of selecting and training executives. Disciplines must be maintained while establishing a fair compensation programme for services rendered.

The third plank is to get the organisation in motion, to give commands. Fayol has written, "The organisation, having been formed, must be set going and this is the mission of command....For every manager the object of command is to get the optimum return from all employees of his unit in the interest of the whole concern" (Fayol, 1949, p. 97). Through the task of commanding, the executive obtains the best possible performance from subordinates. This, to Fayol, must be done through example, knowledge of the organisation, knowledge of the subordinates and continuous contact with the staff. In essence the executive maintains a high level of activity by instilling a sense of mission.

The fourth plank is co-ordination. Organisations have a variety of tasks to perform, so co-ordination is necessary. Fayol has written, "To co-ordinate is to harmonise all activities of a concern so as to facilitate its workings and its success" (Fayol, 1949, p. 103). Efforts must be made to ensure that all activities are aligned and kept in perspective with the overall aims of the organisation.

The fifth plank is control. Once the whole organisation has been created and set working, control is needed to verify whether all is going according to plan, and to point out divergences for correction. "Control consists in verifying whether everything occurs in conformity with the plan adopted, the instructions issued and principles established" (Fayol, 1949, p. 107). To be effective, Fayol suggests that control must operate quickly and there must be a system of sanctions. To him a good system of control provides against undesirable surprises and like the other four elements, demands constant and sustained attention.

Luther Gulick proposed a classification of the work of the executives which extended Fayol's. He referred to this scheme as POSDCORB, an acronym for planning, organising, staffing, directing, co-ordinating, reporting and budgeting. The tasks of planning,
organising and co-ordinating bear a strong resemblance to those described by Fayol. However, Gulick replaced Fayol's task commanding with one he called directing. While Fayol's commanding is a subtle way of getting subordinates to carry out tasks, Gulick understood directing to be the making of decisions and stating them as orders. Gulick also replaced Fayol's task control with budgeting. While Fayol viewed control as ensuring that all plans and tasks are carried out accordingly, Gulick saw budgeting as more restrictive. It is limited only to fiscal and accounting procedures. Gulick added two new tasks, namely staffing and reporting. Staffing included recruitment and training. Fayol did not totally neglect recruitment and training. However, he made them part of the functions of organising. Gulick described reporting as keeping those to whom the executive is responsible informed by means of records, research and inspection.

A third thinker of the classical school is Mary Parker Follet. She was a student of philosophy, history and political science and wrote a number of works on political science. While active in social work, she also gained a reputation as a writer and spent the last years of her life lecturing. Her collection of lecture papers was later published under the title "Dynamic Administration" (Fox and Urwick, 1973). Her writings attempt to define management in terms of human problems. Unlike other classical writers who were practising executives and developed their ideas from their experiences, Mary Parker Follet based her observations on her personal contacts with managers. She did not support her thoughts by any formally designed research, but as Fox and Urwick have observed: "Her insights and conclusions came rather from a unique combination of intellectual power, human sympathy, personal experience and a singular dedication to what she called 'the wonderful interest of life'.” (Fox and Urwick, 1973,p.ix).

Her ideas and insights on management were recognised by other classical writers who integrated her thoughts into the classical framework. The concept of partnership forms the basis of her views of executive work. The core of her contribution is the proposition that the primary task of executives is to create a “situation” in which people cooperate of their own will. She described the roles of executives within four fundamental principles of organisation. These are evoking, interacting, integrating and emerging.
Evoking is the drawing out from each individual their fullest potentials. She has written, "it is one of the leader's chief duties to draw out from each his fullest possibilities" (Fox and Urwick, 1973, p. 232). This particularly emphasises training and development. An executive is seen as both a leader and a teacher and it is his duty to educate the subordinate to work with the leader, not to follow him.

Interacting is adjusting between individuals and the situation, with resulting changes in both. It indicates that management tries not to create a new situation, but to make reciprocal adjustments.

Integrating refers to the solution of conflicts. Conflicts arise from change. Follet argued that the usual managerial reactions to change are either domination or compromise, but these two tactics have only temporary effect. She advocated a process in which parties in conflict would interact in the light of the existing facts and allow a solution to emerge that none of the conflicting parties had previously considered. This is how Follet understood the process of integrating. She has described, "the great leader is he who is able to integrate the experience of all and use it for common purpose. All the ramifications of organisation are the ways he does this; they are not set up to provide a machinery of following" (Fox and Urwick, 1973, p. 233).

Emerging means bringing new ideas into use to meet changing and new situations. Follet used the expression as to her "it denotes the evolving, the creating of new values, the forward movement" (Fox and Urwick, 1973, p. 233).

Apart from the classical writers there are a few other writers who made similar contributions to the understanding of executive work. One of them is Chester Barnard. As most other classical writers, Barnard based his propositions on his experiences. He was for many years President of the New Jersey Bell Telephone Company. As a practising executive, he was very interested in organisational activities and the social and personal relationships between people. This culminated in his book, *The functions of the executive* (Barnard, 1968).
To Barnard the functions of executives "relate to all the work essential to the vitality and endurance of an organisation, so far, at least, as it must be accomplished through formal co-ordination" (Barnard, 1968, p. 215). However, Barnard not surprisingly recognised that not all work done by persons occupying executive positions is in connection with executive functions. Thus, executive work to Barnard "is not that of the organisation, but the specialised work of maintaining the organisation in operation" (Barnard, 1968, p. 215). It consists of three tasks: the maintenance of organisational communication; the securing of essential services from individuals; the formulation of purpose and of objectives.

The task of communication has two phases. The first is the definition of organisational positions or as he called it the "scheme of organisation." This requires organisation charts and the specification of duties. It represents how the co-ordination of the processes of the organisation is to be done. The organisational structure is, however, of little value without the personnel to fill the positions. Hence, the second phase of the communication task is the recruiting of personnel who have the necessary qualifications. This involves the selection of men and the offering of incentives; techniques of control permitting effectiveness in promotion, demoting and dismissing men; and the securing of an informal organisation in which the essential property is compatibility of personnel. The chief functions of this informal organisation are expansion of the means of communication with reduction in the necessity for formal decisions, the minimising of undesirable influences, and the promotion of desirable influences concordant with the scheme of formal responsibilities.

After getting the qualified personnel, the second task is to secure their services or to get their commitment to serve. It has two phases. The first is the bringing of persons into co-operative relationship with the organisation, and the second is the eliciting of their services. Both are achieved by maintaining morale, and schemes of incentives, deterrents, supervision and control, as well as education and training.
The formulation of purpose and objectives necessitates the indoctrination of those at the lower levels with general purposes and major decisions. This activity is necessary in order to make the organisation a cohesive organic whole.

Most of the classical propositions of executive work derive from personal experiences of these practitioners. This may not form a suitable basis of generalisation. There is a likelihood that they may only described the more important or significant tasks, leaving all those unimportant tasks which may have taken a large proportion of their time. They may also cover only those tasks which they can easily define. Thus, in general, they agree that managers plan, organise, motivate, and control. This kind of analysis though useful in giving some idea of the nature of executives' job, does not really tell the exact work or activities executives do. Some of the writers concentrate only on certain aspects of executive work. Mary Parker Follet, for example, has looked mostly at the human aspect, how executives should manage people. This, however, presents only a proportion of executive work. Similarly, Barnard has described executive functions as principally getting co-operation from the people to accomplish organisational tasks.

2.3.2 Empirical studies of executive work

A different approach to the classification of executive work is referred in the empirical studies that have been carried out from the late 1940s onwards. These studies arise from systematic analysis of the characteristics and content of executives' activities. The father of this school is Sune Carlson, a Swedish professor, who did an empirical study of executive work by using a diary method. He has expressed the purpose of the research as:

The purpose of this study has been neither to develop any normative rules as to how executives should behave, nor to describe their 'typical' or 'average' behaviour. But by studying a series of individual cases I have hoped to find certain common behaviour patterns and some general relationships which characterise these patterns. (Carlson, 1951, p.10).
He studied nine executives of Swedish firms for four weeks each. These executives were all managing directors. He asked them to fill out time diaries to record their daily activities.

The items that he recorded were:

i. place of work
ii. contact with persons or institutions (e.g. subordinates, customers)
iii. Communication technique (face-to-face, telephones, meetings)
iv. Nature of question handled:
   a. Field of activity or functional area (e.g. finance, production, personnel)
   b. Development or current operations
   c. Policy or application
v. Type of action taken - getting information; systematising information; taking decisions; confirming or correcting decisions of others; giving orders; advising or explaining; inspecting or reviewing; executing; personal development.

From these records Carlson has concluded that:

i. Executives' workloads are heavy, averaging between 8.5 and 11.5 hours daily;
ii. Executives are frequently interrupted, having only a duration of 10 to 15 minutes interval alone;
iii. Executives had little control over the design of their own workdays;
iv. Executives receive far more mail than they initiate;
v. Executives spend on average 3.5 hours per day with visitors.

Carlson's findings, however, defined only the executives' work characteristics. Due to the inherent limitations of the diary method, he was unable to elaborate on the content of executives' work. Moreover, there is no common understanding of the classifications that he used. Thus, executives in his study interpreted categories inconsistently and sometimes ascribed the same activity to more than one. Carlson has admitted:

What one executive regards as a question of development, another may find to be a question of current operations, and there may even be inconsistencies
in the markings of the individual chief executive during different periods...It was much harder to determine whether a question was of a policy character or not. (Carlson, 1951, p. 105-106).

The same problem occurs with the kind of action markings. Carlson has noted:

The study of the kind of action was, as I expected it to be, the most difficult part of our whole investigation, and neither the concepts nor the recording technique used are as yet sufficiently refined in this respect. (Carlson, 1951, p. 49).

Carlson’s study, therefore, fails to describe adequately the kind of work that executives do.

Rosemary Stewart (1967) has conducted another study of executive work using a diary method. Her study was of 160 British executives with the objective of discovering similarities and differences in the way executives spend their time. However, recognising the difficulties in recording the work content, she made little attempt to identify the nature of executive work:

The main conclusion from experiments with different types of diaries was that only simple, easily defined information could be collected if the information is to be comparable. In particular the kinds of action classification used in the studies described earlier was shown to be very unreliable. It is not difficult for a manager to be reasonably consistent in classifying his own work under such headings as ‘getting information’ or ‘planning,’ but the discussions at the seminar and at the courses showed wide differences in what people understood by such terms. Even when the terms were defined, differences in interpretation persisted. It was therefore decided to exclude a classification of kinds of action, such as planning or giving information, from the main diary. (Stewart, 1967, p. 20-21).

Stewart reaffirmed that executives’ jobs are fragmented. “A manager’s job is a varied one... in the place of work, in the contacts, in its activities and its content” (Stewart,
Executives must attend to many different people and problems, and they have little control over when and whom they meet. Although her findings did support the earlier work of Carlson's on executives' work characteristics, she too did not manage to describe the work content.

Another diary study is that of Copeman (Copeman et al., 1963). Copeman was a director of a publishing company and had been an editor. His interest in executives' work began when he wrote a thesis on the career of company directors. He studied 29 British chief executives and a similar number of department heads. The main aim of the study was to find out how executives spent their working day. Copeman has classified executives' activities into the following categories:

i. correspondence
ii. phoning
iii. discussion in own office
iv. visiting others for discussion
v. committee meetings
vi. reading reports
vii. drafting reports
viii. planning future operations
ix. lunch (including business lunch)
x. Inspecting plant, establishments, etc.

He asked the executives in the survey to mark the type of activities they performed at various times of the day and the contacts they made. Similar to Carlson's conclusions, Copeman has found that the executives in the study spent long hours at work, on average 53 hours a week. The results indicate that 75% of the executives' time was spent on communication activities, leaving only the remaining 25% to do their own desk work. Out of the communication activities, discussions, correspondence, and visiting formed the major proportion.
These studies have shown that the diary method is useful in determining the characteristic of executive work, but is of little help for determining its content. Stewart has highlighted this limitation:

The most important conclusion that I reached was that it is impossible to design a diary of kinds of action...This conclusion imposes a very important limitation on the possible scope of analysing managers' job by means of diaries, since it means that if one wants comparable results - and that surely must be the aim - one is severely restricted in analysing what the manager does, as distinct from where, how, or with whom he does it. (Stewart, 1967, p. 230).

H. Luijk, a Dutch management consultant, has adopted a different method in studying executives. He has specialised in organisational problems and had written numerous articles on organisational subjects. His book on how directors spend their time was a best seller. Luijk (Copeman et al., 1963) based his study on observation of 25 Dutch executives, both private and public. He spent a total of 1000 hours observing their activities. The executives’ secretaries assisted in the observation.

From the study Luijk has categorised executives’ job into the following categories:

i. telephone contacts
ii. correspondence
iii. meeting with staffs and visitors
iv. making plans
v. interviewing prospective employees
vi. giving instructions
vii. reading files
viii. conferences and business calls
ix. sundry

Even though employing a different approach in his study, Luijk’s findings were similar to other diary studies such as Copeman’s. Executives spent nearly three-quarters of their
time on communication and had very little time to do their own work. They were continuously interrupted. Luijk’s categorisations of the executives’ activities were, however, superficial such as his category of sundry. This is particularly unfortunate since 18% of the executives’ time was recorded under this category.

A more well known observational study of executive work is that of Mintzberg. Mintzberg (1973) tried to overcome the limitations of diary studies and attempted to look further into the content of managers’ work by using a structured observation method. Even though the method restricted the sample size and thus generated less data concerning executives’ job characteristics, Mintzberg has argued that “I was happy to trade off this kind of data in return for more powerful data on activity content” (Mintzberg, 1973, p. 231). With the structured observation method, the researcher is able to record detailed information on important incidents and to categorise these either during or after the events have taken place. This makes the record more complete and the observer is much less likely to omit a recording through work pressure.

Mintzberg based his study on structured observations of five managers from both public and private sectors. These five were all executives in the sense used in this dissertation. Each observation was for one week. The study proceeded through three stages. The first stage was the collection of preliminary data on all the five executives before the observation began. The second stage was the recording of activities during the observation. The third was the coding of the observations. He collected data throughout the working day. He did the coding at the end of each day. The coding consisted of three records. The first was the chronology record which described the activity patterns. The second was the mail record which described every piece of incoming and outgoing mail. The third was the contact record, describing each verbal contact. He analysed all these records later. The key to the study was the categorisation of the purpose for both the mail and the contact records. These categorisations described the essential content of managerial activity and Mintzberg later used them to develop his taxonomy of managerial roles. For the mail record he chose thirteen categories:
i. Acknowledgements - came mostly from outsiders, formally acknowledging a visit, a favour, information received or a completed job;

ii. Status requests - requests made to the executives due to their status;

iii. Solicitation - similar to status requests, come mostly from trade organisations who want to sell their products or from universities and consultants, who want the organisation to participate in their proposed or coming events;

iv. Authority requests - written requests from subordinates seeking authorisation for certain actions or seeking approvals for certain programmes or actions;

v. Reference data - mails which contain information for reference only and may come from both outside and inside the organisation;

vi. General reports - reports of general interests coming mostly from subordinates;

vii. Periodical news - magazines and newsletters;

viii. Events - information on events in and around the organisation;

ix. Reports on operation - may be regular internal reports or ad hoc reports on specific programs;

x. Advice on situations - reports from subordinates or experts which were sought earlier;

xi. Problems and pressures - mails that carried information related to certain problems or demands;

xii. Ideas - letters containing certain ideas, mostly unsolicited;

xiii. Self-initiated mail.

In coding the verbal contacts, Mintzberg developed the following categories:

i. Non-managerial work;

ii. Scheduling - brief, informal contacts for purposes of scheduling time;

iii. Ceremony - events that the executive has to attend due to his status;

iv. External board work - to a limited extent, most executives are involved in the board work of other organisations;

v. Status request and solicitations - executives were always approached by their peers, suppliers and other outsiders for visits, functions and for contacts;
vi. Action requests - these are normally requests for authorisations, for information and for executives to initiate something;

vii. Executive requests - these are requests made by the executive to the other parties such as subordinates;

viii. Observational tours - occasionally executives walk round the organisation to see something of interest;

ix. Receiving information - executives receive information through telephone calls, meetings, briefings and by attending conferences and listening to comments from various sources;

tax. Giving information - executives pass information received through to subordinates. They also give information in the form of plans, policies and advice;

xi. Review sessions - these are discussions of important issues; functional discussions of certain operations, post-meeting reviews and organisational board meetings;

xii. Strategy meetings - usually held with subordinates, directors and outside experts to discuss a certain key decision;

xiii. Negotiation - executives occasionally meet with outsiders in an effort to reach agreement over certain issues;

Based on this study he too has demonstrated that an executive’s job is characterised by pace, interruptions, brevity, variety and fragmentation of activities and by a preference for verbal contacts. Executives spend a considerable amount of time in scheduled meetings and in networks of contacts outside meetings. They deal with specific rather than general issues and always live with pressure to allocate their time to the most pressing matters. The fragmentary nature of what executives do lead to the suggestion that they have to perform a wide variety of roles.

Using the categories from his analysis of the mail and contact records, Mintzberg has suggested that there are ten managerial roles which can be grouped into three areas: interpersonal; informational; decisional. Figure 2.1 shows the breakdown of these roles.
FIGURE 2.1: Mintzberg’s Model of Managerial Roles

Interpersonal roles are relationships that an executive must have with others. The three roles within this category are figurehead, liaison and leader. Mintzberg has written, "Figurehead identifies the manager as a symbol, obliged to carry out a number of social, inspirational, legal and ceremonial duties" (Mintzberg, 1973, p.96).

Executives have to act as figureheads because of their formal authority and symbolic position, representing their organisations. An executive officiating an exhibition sponsored by his organisation is acting in the role of figurehead. So does an executive signing an agreement for a joint venture with another company. The leader role as Mintzberg has written: "identifies the manager’s relationship with his subordinates. He defines the milieu in which they work, motivates them, probes into their activities ...and takes responsibility for hiring, training, and promoting them." (Mintzberg, 1973, p.96).

As a leader, it is his responsibility to integrate the individual needs and the organisational objectives. This role is similar to Barnard’s second function of executives, that is of
securing the essential services from individuals. An executive acts in his capacity as a leader every time he gives advice or reassurance to his subordinates either on their personal or work related problems. He performs a leader role when he criticises a procedure that is wrong or compliments on a job well done.

The third interpersonal role, liaison, deals with horizontal relationships: “In the liaison role the manager develops a network of contacts outside of his organisation, in which information and favours are traded for mutual benefits” (Mintzberg, 1973, p. 97).

The executive develops a network of relationships with his peers and with other individuals and groups outside his organisation. He develops these in both formal and informal ways by joining clubs, attending conferences and other social events. A government minister visiting his counterpart in another country is developing his liaison role and so does a company president sitting on a government committee.

Informational roles require executives to collect, disseminate and transmit information. The three roles within this category are monitor, disseminator and spokesman. As a monitor the executive, “continually seeks and receives information from a variety of sources in order to develop a thorough understanding of the organisation and its environment” (Mintzberg, 1973, p. 97).

An executive is an important figure in monitoring what goes on in the organisation, receiving information about both internal and external events, analysis, ideas and trends as well as information in the form of pressures and demands. An executive is a monitor when in a meeting he is briefed on the wage demands made by a union. A government minister reading a report on a neighbouring country’s economic strategy is also acting as a monitor.

Often, an executive has to pass on the information to others in his organisation. This process of transmission is the dissemination role, “[a]s disseminator the manager sends external information into his organisation and internal information from one subordinate to another” (Mintzberg, 1973, p. 97). An example of a disseminator role is when an
An executive often has to convey information concerning the organisation to outsiders, that is the general public and those in positions of influence. This is the spokesman’s role. Mintzberg has defined this role very clearly:

As spokesman the manager must transmit information to various external groups. He must act in public relations capacity; lobby for his organisation; keep key influencers informed; inform the public about his organisation’s performance, plans, and policies; and send useful information to his liaison contact. (Mintzberg, 1973, p. 97-98).

A minister giving a briefing on his country’s development and vision to a group of foreign delegates is acting as a spokesman. Similarly, an executive highlighting his company’s annual performance to the financial press is also acting as spokesman.

Decisional roles involve an executive’s participation in making strategy. Mintzberg regards this as the most important executive activity. The four roles that he places in this category are entrepreneur, disturbance handler, resource allocator and negotiator. These roles characterise different sorts of decision in which the executive is involved. As entrepreneurs executives make decisions about changing what is happening in an organisation. They may have to both initiate change and to take an active part in deciding exactly what is to be done. An example of this role is one given by Mintzberg about a school superintendent who is reacting to public debates about serving school children lunches. In deciding and initiating a pilot lunch programme, the superintendent is acting as an entrepreneur.

As entrepreneur, an executive acts voluntarily. This is very different from his role as a disturbance handler. Here executives have to make decisions which arise from events beyond their control. Mintzberg has explained, “As his organisation’s generalist, the manager must take charge when his organisation meets with an unexpected stimulus for which there is no clear programmed response. In effect, he assumes the role of
disturbance handler” (Mintzberg, 1973, p.98). A currency crisis in a country makes the head of state a disturbance handler. He needs to find ways to solve the problems or at least, reduce the adverse effects of the crisis.

The resource allocator role involves choice making in the distribution of organisational resources. An executive has to budget money, people, equipment and time. Mintzberg has pointed out that in doing so an executive is actually scheduling time, programming work and authorising actions. An example of this role is the decision made by a company president to open a subsidiary company in a foreign country. Another would be his decision to make a contribution to a charity in the name of his firm.

The negotiation role is put in the decision category by Mintzberg because it is “resource trading in real time” (Mintzberg, 1973, p.91). An executive has to negotiate with others and in the process is able to make decisions about the commitment of organisational resources. Mintzberg has observed: “as negotiator the manager takes charge when his organisation must engage in important negotiation activity with other organisations. He participates as figurehead, as spokesman, and as resource allocator” (Mintzberg, 1973, p.99). In this role Mintzberg has given an example of a negotiation for the acquisition of a firm. Here the company president leads his organisation and plays the central role in the negotiations.

For Mintzberg, these ten roles provide an improved description of what executives do. However, he recognises that there are variations to these roles. He attributes those variations to the deterministic influence of four variables: environment, job, person, and situation. Mintzberg’s approach represents executive work as a set of discrete, observable activities. He has associated these activities with the occupancy of a formal office or position which is seen to be shaped and modified by the four nested sets of variables.

However, Mintzberg bases his detailed analysis only on a sample of five executives. Compared with other empirical work, he has the smallest sample. Generalisations are thus difficult. Mintzberg has derived his findings directly from the structured observations and interviews he made with executives. What he created is a taxonomy of executive
work without any theoretical underpinnings. Sproull (1984) has criticised the use of general labels on the executives’ activities. He has argued that most executives’ activities can be labelled by more than one-purpose category; therefore giving them single-label such as “monitoring the environment” or “negotiating” is misleading. Sproull (1984) has also pointed out that although Mintzberg’s work is thorough, the latter excludes some minor executives’ activities such as contacts with the secretary or a phone call from the spouse. Mintzberg has also ignored social activities which are not related to the job such as attending a golf club board meeting. Sproull has commented that these will lead to the underestimation of the executives’ total time budget during the workday.

A decade later Kurke from Carnegie-Mellon University and Aldrich from the University of North Carolina (1983) have replicated Mintzberg’s study with the objective of validating his findings. They have studied four top executives in New York, two from the public sector and two from the private sector. Three of them came from the same industries as Mintzberg’s executives. They followed Mintzberg’s procedures and his method of recording the observation.

The results support strongly Mintzberg’s chronological and contact analysis. They validate further Mintzberg’s characterisation of executive work. They also affirm Mintzberg’s hypothesis explaining the variations of executive work. In fact the data show that the larger the organisation, the more time executives spend in formal communication and the less fragmented their activities. The study also indicated that executives in more competitive environment, spend more time in unscheduled meetings and have more fragmented activities. This finding supports Mintzberg’s hypothesis that, the more dynamic the organisation, the more varied and fragmented the work.

Replicating Mintzberg’s study, Kurke and Aldrich (1983) have confirmed the validity of his results, reinforcing the image of executives as operating in a work setting characterised by fragmentation, brevity and concentration on live media. Although using Mintzberg’s categories in analysing their mail and contact records, Kurke and Aldrich did not mention the 10 managerial roles of Mintzberg.
Kotter (1982a and 1982b) has performed another observational study of executive work. A professor of organisational behaviour at Harvard Business School, he based his study on interviews and structured observation of fifteen general managers across the United States. All the fifteen were from the private sector. Almost all of them were in executive positions. His data collection involved three visits to each executive over six to twelve months. From the visits he collected relevant documents pertaining to the organisation and the executive. He interviewed the executive and a few of his supporting personnel and observed the executive's minute-to-minute activities. He also gave a questionnaire asking for the executive's background.

From the data collected, Kotter has suggested three main activities of executives. These are agenda setting, network building, and execution. Agenda setting covered short, medium and long-term responsibilities. They included goals, priorities, strategies and plans that are not in the written documents. Kotter has stated that in comparison with a formal plan, the executives' agenda tended to be less detailed in financial objectives and more concerned with strategy and plans for the organisation. Kotter's study has suggested that executives do not begin their job with a clear-cut set of objectives and policies. Instead, they spend time developing a loose set of goals and plans. Network building means developing co-operative relationships with all those people who may play a role in the development and implementation of the executives' emerging agenda. This means not only relationships with the subordinates, but with everybody upon whom they depend. These may be their peers or outside individuals and groups. This is similar to Mintzberg's interpersonal role of liaison. To Watson (1987) this means that managerial work is essentially social rather than fundamentally analytical. Execution is the task of implementing the agenda. An executive carries this out with the assistance of the network that he has set up. An executive may use his position, his knowledge, and his information to help in implementing the task. Kotter has shown how effective executives skilfully use their access to institutional resources to build political alliances and influence people. He has revealed, for example, how executives obtain information and support from supervisors without appearing to be over-demanding or inadequate; how they seek to motivate and supervise subordinates; how they elicit co-operation from corporate and external groups despite resistance.
Unlike Mintzberg, Kotter did not show detailed analysis of his observations. Despite observing and recording 500 hours of executive activities, he did not elaborate on these activities. This may be because the objectives of his study were broad. Besides studying what executives do daily, he also looked into their job demands and how these vary between jobs, businesses, and corporate contexts; why executives are effective and how their personalities and backgrounds play a part. Though the methods he used were extensive and cover three times more executives than Mintzberg, he did not consider the content of executive work extensively.

Luthans, Hodgetts and Rosenkrantz (1988) have performed a more recent study of managers' work. Fred Luthans is a professor of management at the University of Nebraska. Richard M. Hodgetts is a professor of management at the College of Business at Florida International University in Miami. Stuart A. Rosenkrantz is an associate professor of management at Eastern Illinois University. They did a work study on forty-four managers. However, unlike Mintzberg's and Kotter's studies, these managers were not all executives. They were managers from all levels with titles such as plant manager, store manager, and district manager coming from both public and private sectors. This study on managerial activities was a preliminary study of what successful and effective managers do.

The researchers used unstructured observation. However, instead of performing the observation themselves, they used trained observers to follow the forty-four managers for a varied hour each day over a two-week period. They compiled activity data from the free observation and organised them into twelve categories of managerial activities. However, for ease of presentation and to synthesise the activities, they consolidated these twelve categories into four groups. These are communication, traditional management, networking, and human resource management.

The communication activities cover exchanging information and handling paperwork. Exchanging information may take the form of scheduled meetings. Paperwork handling covers the preparation of reports and correspondence.
Traditional management includes planning, decision-making and controlling. Planning is the setting of goals and the reviewing of performance. Decision-making involves making recommendations to higher management and selecting solutions to problems. Controlling means a manager checks on work progress and inspects finished products or services.

Networking includes interacting with outsiders and socialising or politicking. To interact with outsiders, the managers get involved with public relations and become members of clubs important to the organisation. In socialising, a manager entertains top-level managers and mixes with peers and subordinates.

Human resource management covers motivating, disciplining, managing conflict, staffing and training. These are similar to Mintzberg’s leadership role where the manager is responsible for reinforcing staff morale, complimenting them for good work or reprimanding them for unsatisfactory performance. The manager is also responsible for mediating when conflict arises. Finally, he is in charge of recruiting suitable personnel and giving them relevant training.

In the context of executive work, this study has several disadvantages. First, many of the managers observed were mostly middle managers with no authority over overall policies and strategic directions of their organisations. They are not all, strictly speaking, executives. Nevertheless, some of the activities identified in the study are relevant. Secondly, the researchers used third party observers. This provides another level of interpretation to the activities, which may affect their accuracy. Thirdly, the method of hourly observation each day may not be representative of the managers’ activities. Fourthly, there were no records or analysis shown of the observations. Luthans, Hodge and Rosenkrantz (1988) did not explicitly describe the basis for the 12 categories of activities.

Isenberg (1986) has focused on executive cognition rather than action. He has stated that executives tend to rely on a general thought process such as using intuition; managing a
network of interrelated problems; dealing with ambiguity, inconsistency, novelty, and surprises; and integrating actions into a process of thinking.

To Watson (1987) managerial work is essentially social rather than fundamentally analytical.

These studies have described the elements of executive work i.e. what do executives do, highlighted the distribution of executives' time between tasks, and show the interactions involved, i.e. with whom executives work. Many of the studies also described the characteristics of executive work. It is fragmented. It is difficult to control and it is very diverse. It combines a specialist and a general element. It varies by duration, recurrence, unexpectedness and source. Much of an executive’s activity consists of asking or persuading others to do things, involving the executive in face-to-face verbal communication of short duration. Much time is spent in day-to-day trouble shooting and *ad hoc* problems. These studies have offered a better understanding of executive work compared to the traditional picture of management portrayed by those writers of the classical school. Among these various studies, Mintzberg's study seems to be the most comprehensive research on the content of executive work. The people he surveyed were executives, and they represented both the public and the private sectors. He described thoroughly the method of structured observations used and the ways these observations were initially recorded and subsequently coded. Kurke's and Aldrich's (1983) replication of Mintzberg's study adds to its credibility. Their analysis was very detailed, covering their correspondence, their contacts and the chronology of events. The categorisations of their activities from which the ten executive roles were developed was fully described and analysed.

### 2.3.3 Theories of executive work.

The study of executive work has a long history. Executives have themselves described what they do. Academics and industry-based researchers have observed executives at work. Psychologists, sociologists, political scientists, and anthropologists have speculated on the nature of executive work. The empirical work shows some coherence, but there is no single theory which successfully explains what executives do. Figure 2.2 offers one possible classification of the existing theories.
It might be said that there are six traditions of theorising about the nature of executive work. Two dimensions are sufficient to characterise the relationship among these six traditions. The major concerns what activity is assumed to be central to executive work. The minor concerns whether the executive is an individual actor or a leader within a group.

Figure 2.2: Theories of Executive Work

The fundamental assumption underlying much management theory is that the central activity of management is decision-making. While workers perform repetitive tasks, managers solve problems. Executives are managers who solve difficult, ambiguous, strategic problems. At first sight this is a reasonable presumption. However, investigations during the last 30 years have done little to clarify the process of decision making.

First, problems do not present themselves well formed to a manager. For example, none of the American automobile manufacturers viewed the appearance of compact Japanese cars within the United States in the 1960s as a problem. Executives particularly work in uncertain or even confused circumstances. Some theorists, therefore, have argued that
there are no clear-cut problems which provoke the need to decide. Rather they believe that executives constantly scan their environments in order to learn what is happening. Hence, the realisation of problems arises from an executive's attempt to understand what is going on around him. A number of prominent educationalists, psychologists, and social psychologists have proposed that it is the shaping of this constant stream of intelligence which is the fundamental activity of executives. To some extent a decision occurs at the instant in which an executive's interpretation of events has solidified into a conviction.

A second problem with the view that decision making is the central activity of the executive is that it assumes that decisions are self-executing. Decisions are not tantamount to action. This point was most evocatively made by Harry Truman who observed General Eisenhower, the newly elected U.S. President, "he'll sit here and he'll say, 'Do this!' And nothing will happen." (Neustadt, 1960,p.9). Effective executives execute. Clearly, the words "executive" and "execute" have the same stem. Historians and political scientists have consistently made the point that successful heads of states and of organisations get things done. Identifying what needs to be done and how it is to be done is of little interest, if it is not done. Within these contexts theories have arisen which assume that implementation is the central activity of the executive.

The minor dimension to the proposed classification of theories of executive work concerns whether an executive acts individually or as part of a group. The intersection of either of these two presuppositions with each of the three assumptions about the fundamental activity of executives forms a category of theories of executive work.

2.3.3.1 Learning
Decision-making has always been viewed as the primary role of executives both at an individual and the group level. This view denies that executives search for meaning and understanding of their organisational context. March and Sevon (1984) have written:

To see life, or management, as decision making is to see it inadequately; and one of the reasons that much of the information that is communicated in organisations, as in life, is
What March and Sevon are clearly saying is that individual and organisational life is better seen as dedicated to developing interpretations of events and understanding past history than to making choices. Understanding is after all a prerequisite to intelligent choice. Hence, knowledge of interpreting and understanding and of predicting and forecasting events are more fundamental. March and Sevon continue, “because understanding what is going on is important, people who understand what is going on are viewed as people of importance” (p.103). If understanding is the primary role of executives, this explains why they are considered the most important people in an organisation.

Learning enhances understanding. Argyris (1982) has described learning as a process in which people discover a problem, invent a solution to the problem, produce the solution, and evaluate the outcome, leading to the discovery of new problems. The process of learning involves the process of researching pre-existing attitudes, perspectives, beliefs and understandings.

Kolb (1984) defines learning as “the process whereby knowledge is created through the transformation of experience.” This definition emphasises several aspects. The first is the focus on the process of adaptation and learning as opposed to content or outcomes. The second is that knowledge is a transformation process, being continuously created and recreated. Third is that learning transforms experience.

Piaget, a well known Swiss developmental psychologist and genetic epistemologist has offered probably the best known theory of learning. Piaget’s work focuses on cognitive-development processes in children, that is on the nature of intelligence and how it develops. He saw his studies as the key to understanding the nature of human knowledge. Simply stated, Piaget’s theory describes how intelligence is shaped by experience. Intelligence is not an innate internal characteristic of the individual but arises as a product
of the interaction between the person and his environment. Piaget's theory revolves around four important concepts. These are:

**Schemata** - intellectual structures that organise events as they are perceived by the organism into groups according to common characteristics. At birth, schemata are reflexive in nature. As the child develops, schemata become more differentiated, less sensory, more numerous and the network they form becomes increasingly more complex. The schemata of the adult evolve from the schemata of the child through adaptation and organisation.

**Assimilation** - the cognitive process by which the person integrates new perceptual matter or stimulus events into existing schemata or pattern of behaviour. The process of assimilation allows for growth of schemata.

**Accommodation** - creation of new schemata or the modification of old schemata. Both of these actions result in a change in or development of cognitive structures.

**Equilibrium** - is a balance between assimilation and accommodation. (Ginsburg, 1979).

In Piaget's terms the key to learning lies in the mutual interaction of the process of **accommodation** of concepts or schemas to experience in the world and the process of **assimilation** of events and experiences from the world into existing concepts and schemata. What this means is that, in facing new experiences, an individual will try to assimilate these into his existing concepts and understandings and in so doing his concepts or schemata will grow. However if he fails to assimilate these, he will then have to accommodate these new experiences by changing or creating new concepts. Learning is thus accomplished through this continuous adaptation between assimilation and accommodation.
Piaget's theory of learning explains the learning role of executives. An executive learns from experience. He acts, observes the consequences of his action, makes inferences about those consequences and draws implications for future action. The ideas, beliefs and attitudes individuals come to hold are the results of these learning process. Learning is then a form of attitude formation and adaptation. Learning occurs when individuals respond to changes in the internal and external environments by detecting and correcting errors in their theory-in-use (Argyris, 1982) and embedding the results of their inquiry in private images. Through learning an executive is able to relate observed events to their future consequences and to their underlying causes. He can establish the link between his past choices and the subsequent state of his organisation.

The view that learning is the primary activity of the executive makes the role of information critical. An executive uses information to learn about his organisation and its environment. He needs to do strategic scanning (El Sawy, 1985) where information about events, trends and relationships in the organisational environment is obtained to assist the executive in identifying and understanding the strategic threats and opportunities facing the organisation. He uses information to develop mental models of how his organisation and its environment function and plans for the direction that it should take.

This learning perspective is partly explained by Mintzberg's monitoring role. He has written:

The manager as monitor is continually seeking, and being bombarded with, information that enables him to understand what is taking place in his organisation and its environment. He seeks information in order to detect changes, to identify problems and opportunities, to build up knowledge about his milieu, to be informed when information must be disseminated and decisions made. (Mintzberg, 1973, p. 67).

Thus through his monitoring role, the executive learns about the happenings in and around his organisation and these become the basis for his actions and decisions.
2.3.3.2 Sensemaking

Theories of learning offer some insight into how an executive acquires an understanding of the world in which he operates. They also suggest how an executive realises that a discrepancy exists between the way the world is and the way he desires it to be. However, since these theories view learning as an act of individual cognition, they say nothing concerning how an executive's understanding may become shared by an entire organisation and how it can be translated into concerted action. Theories of sensemaking address these two deficiencies and so provide a more persuasive explanation of organisational learning.

Weick's explanation of sensemaking is probably the best known. He begins his discussion by contrasting ignorance and confusion. Problems arise because the world is not as one wishes it to be. Overcoming the difficulty depends on understanding the causal structure of a situation and having a preference for how it should be altered. Members of an organisation may disagree about the causal mechanism and may even have different preferences. They, therefore, will dispute the possible solutions. This is characteristic of ignorance. Weick and Meader believe that information decreases ignorance. They have written "[p]eople experience uncertainty because they do not yet have an answer to the question of options, but they do know that some kind of answer is possible. And they know that as more information is obtained, they will have a better sense of what the answer might be." (Weick and Meader, 1993,p.233-234).

Confusion, on the other hand, occurs when equivocality about causal relationships and preferences exist. In this situation individuals can not determine whether the right question is being asked or whether there is even a problem. Weick and Meader have explained "[t]he activity of bracketing and framing an event as a decision, with some amount of agreement concerning its causal structure and some amount of agreement on preferences for its outcomes, is a process of sensemaking" (Weick and Meader, 1993,p.234).

Confusion then "...leads to the exchange of existing views among managers to define problems and resolve conflicts ..." (Daft and Lengel,1986b, p.557). This exchange
sharpen their understanding both of potential causal mechanisms and of potential preferences among them. More importantly, interpretations begin to emerge concerning the plausibility of the various potential causes and preferences and the executives begin to discover whether they agree or disagree on these interpretations.

Throughout his writing Weick refuses to offer an explicit model of sensemaking. Instead he provides metaphors, heuristics, and characteristics as a means of helping the reader imagine the process of sensemaking. For example, one explanation which he provides is sensemaking occurs when: "[p]eople concerned with identity in the context of others engage ongoing events from which they extract cues and make plausible sense retrospectively, all the while enacting more or less order into those ongoing events" (Weick, 1995, p.18).

This statement attributes seven characteristics to sensemaking. Sensemaking is:

i. Grounded in identity
ii. Retrospective
iii. Enactive of sensible environment
iv. Social
v. Ongoing
vi. Focused on and by extracted cues
vii. Driven by plausibility rather than accuracy

Weick immediately cautions that far from being a model of sensemaking this characterisation is only a rough guide. In fact the sequence imposed on the act of sensemaking by the sentence is too restrictive because it does not allow for the interactive and concurrent nature of sensemaking to be represented.

His first notion is that sensemaking is grounded in the construction of an understanding of the world. People learn by projecting themselves into their environment and observing the consequences. From these interactions they shape their own views of the world and their place in it. However, they not only form impressions about their own behaviour from the conduct of others, but they also seek to influence others' conduct. Hence, these
interactions are double-edged. They forge the character of the executive, while they affect the workings of his environment.

These interactions constitute for an executive a continuous stream of experience. However, experience as we know it consists of discrete events. This is because meaning occurs when an executive marks out a portion of this stream of experience from the rest. In other words sensemaking demands an individual's attention. This is a process which occurs in the present, but which focuses on the past. Therefore, sensemaking is a retrospective activity.

Interpretating experience is not straightforward. The learning analogy views it simply as placing information within the context of some existing cognitive structure. However, it is far more likely that an executive will be faced with a number of possible meanings. Sensemaking will require him to weigh and measure them if he is to produce a synthesis. The interpretation of an event concludes only when its significance is integrated into a pre-existing view. It is, of course, these views which guide future actions. Therefore, the decision to interpret an experience in a particular fashion is likely to cause an executive to act in such a way in the future so as to confirm the interpretation. In this manner its environment is not something separate and apart from an organisation. The two enact a form of mutual causality because an executive uses his interpretations of incidents within and without his organisation as a guide to action which in turn enacts his environment. This process creates constraints on further actions by an executive.

The aforementioned characteristics of sensemaking point clearly to its social nature. It does not arise out of individual cognition, like personnel learning. It requires interaction with others as a source of its raw material. It builds expectations as to how others will act in the future and it results in measured actions which affect others' interpretations. In short the sensemaking view assumes that thought and social action are two sides of the same coin.

Because sensemaking arises out of a continuous stream of experience and leads to action which produces further experience, it is ongoing. It never stops. As Weick has written
"[people] are always in the middle of things, which become things, only when those same people focus on the past from some point of view beyond it." (Weick, 1995, p. 43).

Of course, not all of the continuous stream is interesting. An executive is likely to notice the novel, the unusual, the unexpected, the extreme, the negative, or the relevant. Much remains unnoticed. It is likely that what will be recognised is some characteristic of the event rather than its entirety. These cues serve as seeds "...from which people develop a larger sense of what may be occurring" (Weick, 1995, p. 50).

Finally, because this approach views the relationship between sensation and actions as so incestuous, accuracy becomes less important. The chief requirement is that sensemaking should produce plausible interpretations which provide a believable basis for action. As Weick has concluded "...executives need to know enough about what ...they think to get on with ...[their] projects, but no more, which means sufficiency and plausibility take precedence over accuracy" (Weick, 1995, p. 62).

Sensemaking as a view of executive work has not yet been absorbed completely into the academic literature (Mintzberg, 1987). However, this approach has some resonance with two of the informational roles described by Mintzberg: the disseminator and the spokesman.

Mintzberg has observed that executives depend not on historical, aggregated data usually found in computer-generated formal reports, but on current data - data which may be vague or unsubstantiated. For this reason he has argued that executives must create their own information systems by developing their own "personal network". Inside the organisation an effective executive’s communication will reach beyond the formal line of command. Outside of his organisation an effective executive will seek to develop contacts with individuals and other information sources which can keep him abreast of happenings which may have a future impact on his organisation.

Mintzberg viewed the disseminator role as requiring an executive to distribute information which he gathered from his environment to various parts of his own
organisation. This information may be factual or it may convey preferences. The executive is well suited to the disseminator role because of his wide contacts outside of the organisation and his knowledge of individual responsibilities within it. On the other hand, the role of spokesman reverses the flow of information. Because of his position in the organisation, an executive will have to speak for his organisation. This requires him to keep his board of directors and his public informed of happenings with his organisation.

The premise of both the disseminator and the spokesman role is still that of the lone executive. Moreover, they imply neither a particular theory of cognition nor even consider how an executive absorbs the information he gathers. However, each highlights the special position an executive has at the centre of a web of communications which connect those who work within an organisation with its general public. This web acts as a means of collecting and distributing information. Thus, it provides the right backdrop for acting out what Weick calls the “[c]onsensually validated grammar for reducing equivocality by means of sensible interlocked behaviour” (Weick, 1979, p.3) which brings about sensemaking.

2.3.3.3 Satisficing

The most widely held view is that making decisions is the central activity of all managers. Much of the literature concerning MIS and EIS adopts this premise unquestioningly. This position presupposes first that problems present themselves well formed to executives. Understanding and problem identification are straightforward activities. This opinion secondly ignores the difficulties involved with carrying out the solution. It assumes that determining what to do is tantamount to doing it.

Classical economics offers the most primitive example of what might be referred to as decision theory. It assumes that all individuals are rational decision-makers. In this context the term “rational” implies that individuals always select from among a number of potential choices the one which is most beneficial to them. March and Simon have articulated the assumptions which underlie this model:
1. When we first encounter him [the executive] in the decision-making situation, he already has laid out before him the whole set of alternatives from which he will choose his action. This set of alternatives is simply "given", the theory does not tell how it is obtained.

2. To each alternative is attached a set of consequences the events that will ensue if that particular alternative is chosen. Here the existing theories fall into three categories: (a) Certainty: theories that assume the decision-maker has complete and accurate knowledge of a probability distribution of the consequences of each alternative. (b) Risk: theories that assume accurate knowledge of a probability distribution of the consequences of each alternative. (c) Uncertainty: theories that assume that the consequences of each alternative belong to some subset of all possible consequences, but that the decision maker cannot assign definite probabilities to the occurrence of particular consequences.

3. At the outset, the decision maker has a "utility function" or a "referencing-ordering" that ranks all sets of consequences from the most preferred to the least preferred.

4. The decision-maker selects the alternative leading to the preferred set of consequences. In the case of certainty, the choice is unambiguous. In the case of risk, rationality is usually defined as the choice of that alternative for which the expected utility is greatest. Expected utility is defined here as the average, weighted by the probabilities of occurrence, of the utilities attached to all possible consequences. In the case of uncertainty, the definition of rationality becomes problematic.
The difficulties with this approach are obvious. Our common-sense notion of rationality corresponds only to the situation in which an executive has:

i. been given a set of alternative choices
ii. has a certain knowledge of the consequences of each alternative
iii. has a precise, consistent, and complete understanding of his preferences

Since such circumstances are rare, the executive usually makes decisions without complete information about alternatives, consequences, and preferences. In these circumstances he may be acting in a "subjectively" rational manner. That is to say that while he has made the best decision possible given the information which was available to him, he might have chosen another alternative had "he only known better". Hence, the decision always takes place against the backdrop of the executive's own simplified understanding of the real situation. In this sense human rationality is always bounded rather than unlimited.

Arising from their criticism of the classical view of rationality, March and Simon have offered a more refined theory of decision making. They have argued that problems arise from something which happens in the external world (a stimulus). A problem may be familiar since it has occurred before. In fact if the problem occurs frequently, there may already be a well-defined strategy (a performance program) for dealing with it. However, if the problem is novel, the decision-maker must search for possible solutions, invent a performance program to effect these solutions, and evaluate the consequences of each solution. These are challenging cognitive activities. Therefore, March and Simon have suggested that human decision making usually concerns the discovery and selection of a satisfactory rather than an optimal solution. They have referred to this process as satisficing. The need to satisfice arises from the cognitive limitations of human beings. As March and Simon have vividly explained: "...to optimise requires processes several orders of magnitude more complex than those required to satisfice. An example is the
difference between searching a haystack to find the sharpest needle in it and searching the haystack to find a needle sharp enough to sew with” (March and Simon, 1958,p.141).

The view that decision making depends on satisficing is clearly an improvement over classical theories in three specific ways. First, the assumption of bounded rationality is an improvement over the belief in complete rationality in that it allows for the cognitive limitations of humans. Secondly, it acknowledges that the evaluation of whether a solution is satisfactory is dependent on an executive’s interpretation of the context of the problem. Hence, it recognises that understanding is a prerequisite and non-trivial precursor to decision making. It views understanding as a complex psychological and social process, but it offers no explanation of that process. Thirdly, satisficing improves upon rational decision making in that it makes obvious the role of information in decision making. An executive uses information in order to develop his understanding of every situation. It is his understanding which determines the minimum criteria for evaluating whether a solution is sufficient. An executive must then search for information regarding possible solutions to a problem. Finally, an executive must evaluate a potential solution against the minimum criteria in order to determine whether it is satisfactory.

Mintzberg has identified decision making as “[p]robably, the most critical part of the manager’s work” (Mintzberg, 1973, p.77) because it is the aspect which justifies his authority. His description of the process of decision making drew heavily on March and Simon. For example, he argued that “decisions range along a continuum, from purely voluntary innovative ones, to involuntary reactive ones (Mintzberg, 1973, p77). The model of the process which Mintzberg described comes from a later book by Simon who proposes that the decision making process has three phases. First, the intelligence phase involves the searching for situations requiring solution. Secondly, the design phase creates and evaluates alternatives. Thirdly, the choice phase selects one alternative (Simon, 1965).

Three of the four activities which Mintzberg has assigned to the decisional roles of managers treat executives as an individual. First, he viewed the entrepreneurial role as requiring an executive to initiate and to design voluntary programs of improvement
which he normally supervises directly. Secondly, he viewed the disturbance handling role as arising from an unforeseen event which cause an organisation's standard performance programmes to break down, for example conflicts between subordinates or sudden losses of resources. In such circumstances an executive must take immediate charge and the disturbance often takes priority over all other tasks because only he can resolve the crisis. Thirdly, Mintzberg viewed the resource allocation role as consisting of three features - the scheduling of his time, the programming of work, and the authorising of actions. An executive's schedule announces to the organisation which issues are important and which are not. Because decisions concerning the program of work within an organisation are usually made in association with an improvement program, the executive often makes programming decisions in association with his entrepreneurial role. When an executive simply authorises the actions of a subordinate, he is acting as an individual. However, the task of authorising others' decisions is usually more complex.

2.3.3.4 Bargaining.
March and Simon have defined conflict as a "breakdown in the standard mechanisms of decision-making so that an individual or group experiences difficulty in selecting alternative actions" (March and Simon, 1958, p.112). It is, therefore, dysfunctional. March, himself, has pointed out the naivety of this assumption. In his paper, "The Business Firm as a Political Coalition" (March, 1962), March has argued that firms were examples of conflict systems, that is:

i. They consist of basic units each of which have defined preferences;
ii. There is conflict because the preferences of the units are mutually inconsistent with respect to the available resources.

In other words organisations consist of individuals each having their own goals. Therefore, conflict is inevitable within organisations. It is the norm, not an abnormality. Hence, an adequate theory of decision making must incorporate some mechanism for conflict resolution. This implies that decisions arise from the interaction of many conflicting interests. An executive rather than acting as an individual is the focal point of this web of interests.
Classical economics proposes that the payments to the members of the organisation serve as an inducement for them to conform to a consistent set of goals. However, March has noted that political theorists adopt a more complex hypothesis for understanding the process of conflict resolution. They argue that the individuals have their own interests and that executives make decisions on resource allocation by forming viable coalitions of individuals (i.e. one in which demands are less than or equal to the resources available to the coalition). This he does by bargaining and compromise. Hence, March has proposed that when an executive faces a problem there may be a number of viable coalitions which he may create. However, each of the potential coalitions will result in a solution which creates some added value for the organisation. A “rational” executive will seek the coalition which will maximise that added value.

In their book, *The Behavioural Theory of the Firm*, Cyert and March (1963) have elaborated the view that an organisation is a political coalition. First, they proposed that organisations avoid uncertainty because prediction is unreliable. Instead Cyert and March have argued that organisations attempt to negotiate their environments by means of adopting “good business practice.” This allows them to gain satisfactory profits and to promote stability in their industry. Likewise, organisations avoid internal uncertainty by attempting to form and to maintain dominant coalitions which change only slowly over time.

There are a number of ways in which this occurs. First, an organisation’s goals are independent constraints imposed on the organisation by the coalition of members who control the organisation. Secondly, organisations do not anticipate problems. They solve problems as they arise and they try to treat them as routine. Innovative solutions may lead to the need to reformulate the governing coalition. This leads to instability and uncertainty. Therefore, organisations avoid decisions which require innovation. Thirdly, routine problems can be analysed into their component parts. The structure of the organisation arises from the creation of specialised units to deal with specific components of routine problems. This reduces conflict because it clearly limits the set of problems with which any part of the organisation deals and likewise reduces the constraints impinging on the solution. This results in a condition to which Cyert and March refer as
“local rationality”. Fourthly, by factoring a problem into a number of smaller problems handled by different units within the organisation, a weak form of consistency can be created. Many of the individual decisions which are made will not be inconsistent with one another and those which are inconsistent can draw upon excess organisational resources to overcome any difficulties which arise. Fifthly, organisations avoid conflict by sequential attention to goals, that is by doing one thing first and then the opposite. While the organisation takes different approaches at different points in time, at any one instant its choices seem consistent. This description of organisational decision making defines the corporate form of satisficing.

Organisations also simplify their search for solutions. Cyert and March have proposed that problems arise from failures to meet goals. Problems, not a need to understand, trigger searches. The department responsible for the unfulfilled goal will instigate the search. This means that the search is biased. They also assume that most searches follow a simple pattern. A searcher first explores the neighbourhood of the problem and if this is not successful, then he examines the neighbourhood of the current alternatives. This procedure reduces the likelihood of finding radical solutions. Of course, if this strategy is unsuccessful, the searcher may have to adopt more complex strategies.

There are two components to the model offered by Cyert and March (1963). The first assumes that organisations consist of individuals who have their own goals and that in order to accomplish anything organisations have to be governed by coalitions which agree a high-level set of objectives. However, they say little about how these coalitions are formed. Secondly, they have argued that in order to preserve these dominant coalitions organisations adopt a variety of simplifying strategies for creating subgoals, for searching, and for deciding. These provide more detail to March’s and Simon’s hypothesis of satisficing, but they offer little to suggest how an executive actually employs bargaining to create coalitions.

Cyert and March have succeeded in placing decision making within the context of bargaining. They have also offered an explanation of how organisations avoid the stress and uncertainty of forming coalitions each time they have to make decisions. By relying
on mechanisms such as the factoring of problems, the use of standard operating procedures, and reliance on negotiated environments, organisations create decision-making routines. In doing this they have limited the role of executives in this process.

However, problems do occasionally arise which cannot be dealt with reflexively. In these cases executives must make strategic or innovative decisions. These situations may require the renegotiations of existing alliances or the creation of new ones. Cyert and March have not really provided an explanation of the role of bargaining in affecting an outcome. These are exactly the decisions which are characteristic of executive work.

In his book *The Politics of Organisational Decision Making* Pettigrew (1973) has attempted to supplement this deficiency in Cyert’s and March’s work. The conceptual framework which he offers to understand strategic decision making arose out of his longitudinal study of an innovative capital investment decision within a British retailer. Here he examined the decision making process as seen, not from the intersanctum of the board of directors, but from the point of view of the system analysts and programmers who advised them on the selection of a new computer. This case study uncovers some of the mechanisms at work when executives have to search outside the dominant coalition in order to inform themselves regarding strategic issues of which they are ill informed.

Like Cyert and March, Pettigrew has argued that decision making is best understood as a “political process that balances various power vectors” (Pettigrew, 1973, p. 265). He has argued that this process has two phases: demand generation and power mobilisation. Since innovative decisions offer organisational actors the best opportunity to voice their demands, he believes that such situations provide an excellent opportunity to examine demand generation and power mobilisation.

Pettigrew has suggested that the amount of conflict within an organisation at the outset of a decision influences the diversity of solutions offered. Moreover, he has claimed that whenever a group lacks consensus, outside pressures will add, rather than narrow, the choice. In fact he believes that innovative decisions are particularly important and keenly
fought because they probably shape the pattern of resource allocation and the channels for bargaining for many years.

These demands are feasible only if their proponents can mobilise sufficient power in their support. This may require modifying demands in order to gain support, negotiating with the organisation's dominant coalition, and undermining opponents' positions. Pettigrew has shown that sensitivity to the political nature of the process was not sufficient to assure success. He has demonstrated that the position and perceived status of the person who voices the demand, the positions of those who hear the demand, and how widely the demand is heard are all crucial determinants of success.

In particular he found that information was a crucial resource in mobilising power. As a result, he has suggested that individuals who sit at the junction of several communications channels will be particularly able to exert bias in favour of their own demands at the same time that they convey negative information about their opponents. He also found that one's ability to convey an opinion which directly influences the decision is vital. This is partly a function of one's position in the structure of the organisation and partly to do with one's circle of friends and acquaintances. In other words an individual's relationship to the dominant coalition is important because it may provide direct access to the appropriate executives. However, it may also be necessary to use indirect channels to mobilise power throughout the organisation. In this case the accuracy of one's perception of the power structure of the organisation is important. Of course, access to the right people is of no use unless one has the status to make one's demand heard.

Hence, the picture which Pettigrew has provided of executive activity is that of an arbitrator in the politics surrounding strategic decisions, that is decisions with which normal organisational processes can not deal. However, there are restrictions on executives in this role because they are heavily constrained by the existing structures and personnel within their organisations. As Allison has written:
Organisational persistence does not preclude shifts in behaviour. Thus, some kinds of important shifts in the behaviour (of organisations) can take place with little change in a particular organisation's parochialism and SOPs [i.e. Standard Operating Procedures]. The degree of these shifts is limited by the range of existing organisations' programs. Occasionally, they [executives] may even effect deliberate change in organisations by manipulating the factors that support existing organisational tendencies. Even in making these various choices, leaders rely for the most part on information provided by, estimates generated by, and alternatives specified by organisational programs. (Allison, 1971, p. 87).

This analysis of innovative or strategic decisions is reminiscent of Williamson's explanation of market failures. He has argued that organisations are preferable to markets for two reasons. First, in situations fraught with uncertainty or complexity, they offer a variety of mechanisms for compensating for bounded rationality. Cyert and March have offered a sophisticated explanation of how organisations achieve bounded rationality. Using these mechanisms it is less expensive to acquire the information required to complete a transaction. Secondly, in situations where there are few participants in the market, they offer a means of overcoming the problem of information asymmetries (Williamson, 1981). Again, organisations offer an affordable way of ensuring that information is available to a decision-maker. However, Pettigrew's examination of the way in which subordinates may use technical knowledge to promote their demands demonstrates that organisations do not entirely overcome the problem of information asymmetry.

Mintzberg has treated the activity of bargaining under the executive's role as a negotiator. He has commented:

Some writers on the management process have criticised the manager's participation in negotiation activity, suggesting that it is unnecessary and nonmanagerial. I believe negotiation is a vital part of the manager's job. The manager participates because as a figurehead his presence adds credibility to the proceedings and as a spokesman he represents his organisation's information and value system to outsiders. But most important, as resource allocator the
manager has the authority to commit organisational resources. Negotiation is resource trading in real-time. It requires the presence of someone with enough authority to commit the quantity of resources at stake, and do it quickly (Mintzberg, 1973, p.91).

In this quotation, Mintzberg still treats an executive as the central person in the bargaining process, but he now clearly recognises an executive as a participant in a group process. He associates this particularly with another decision-making role, resource allocation. This is because a programme of work is one of the likely outcomes of negotiation. In his role as a resource allocator an executive may also authorise the outcomes of negotiations.

Obviously, there are features of the three other aspects of the decisional role in the bargaining view as well. Because organisations attempt to avoid conflict by a variety of mechanisms, Cyert and March have implied that executives act mostly within the context of innovative decisions. This would associate them closely with the entrepreneurial role. In fact the description provided by Pettigrew of the executive's role in bargaining resembles disturbance handling more closely than entrepreneurship. Of course, resource allocation underpins both activities.

2.3.3.5 Commanding

Probably, the oldest view is that command is the essence of executive work. This belief has informed the actions of generals and of kings throughout written history. Obviously, command means the giving of orders which are to be executed unquestioningly by subordinates. In fact the term "executive" refers to implementing instructions fully rather than either to understanding or to deciding.

Barnard was one of the earliest to provide an explanation for the phenomenon of executive command. In his book *The Functions of the Executive* (1968) he has argued that an organisation is a co-operative enterprise of individuals in pursuit of a common purpose. There are three necessary and sufficient conditions for any organisation:
i. there are persons able to communicate with each other;
ii. who are willing to contribute action;
iii. to accomplish a common purpose.

An executive is responsible for sustaining the equilibrium of an organisation and ensuring its survival. He does this by maintaining the lines of communications, by securing the services of individuals, and by formulating, as well as by conveying, the goal of the organisation to workers. Of these three executive functions, he believed recruiting suitable people and ensuring their commitment to the common purpose are the most essential.

Barnard's fundamental premise was that individuals contribute to organisational objectives only when the advantages of co-operation outweigh the disadvantages. Ideally, people aid organisations which are pursuing causes to which they are sympathetic. While executives often romanticise the devotion of their workforce, this motive rarely explains why commands are obeyed. Barnard offers three additional reasons: coercion, indoctrination, and incentives. Historically, many executives who have relied on commanding as a means of action have used force or the threat of force in order to ensure compliance. However, there is a more subtle way. They need not depend on compulsion if they can inculcate people to adopt the programme of their organisation. This deliberate process of indoctrination is called variously education or propaganda. On the other hand, incentives may include material inducements, personal opportunities, desirable physical conditions, satisfaction of personal ideals, social compatibility, and others.

Barnard has argued that an executive's authority to command derives from his subordinates' willingness to accede. Of course, this depends on the means available to an executive to reward or punish those below him in the organisational hierarchy. In other words the executive's office provides him with a legitimate basis of power. However, power is a brutal tool. Subordinates may carry out an executive's instructions because of esteem, loyalty, or a sense of duty. Such sentiments arise as much from the prestige
associated with the office as from the qualities of the holder of the office. Therefore, it is both authority and status which underpin the executive’s command.

Fayol echoed this view when he wrote “[a]uthority is the right to give orders and the power to exact compliance” (Fayol, 1949, p.97). Because of his status and because he occupies a central position in the communication structure, an executive can direct and instruct the courses of action for subordinates to follow. For this reason Fayol identified command as one of the characteristic features of executive work.

Weber saw authority as willing compliance and viewed power as a form of domination. To him power is an individual’s ability to impose his will on others despite resistance. French and Raven (1960) have argued that the strength of power a person possesses in a given system is his maximum potential ability to control. They see power as stemming from five sources. First is reward power. This depends on both the absolute and perceived expectations by the people of the number of rewards an executive can muster. Second is coercive power. This, on the other hand, depends on both the absolute and perceived expectations that punishment will follow if one does not comply with the executive’s wishes. Third is legitimate power. This stems from a value which dictates that an executive has the right to command and those below have an obligation to comply. This kind of power rests upon cultural values and acceptance of a social structure. Fourth is referent power. It is based on the identification of those influenced with those influencing. Fifth is expert power. This stems from the perception that the executive is more knowledgeable.

Like Barnard, Mintzberg has viewed the leadership activity, an interpersonal role, as being explicitly concerned with the melding of individual demands into organisational goals. This, of necessity, requires the executive to oversee the award of incentives and to issue rebuke as well as undertaking many other motivational duties. Interestingly, Mintzberg does not encompass the activity of commanding explicitly within his set of executive roles.
2.3.3.6 Persuading

In his book *Presidential Power* Neustadt has discussed the nature of presidential leadership within the U.S. government (Neustadt, 1960). His analysis offers a sharp insight into the nature of implementation. He has argued that a common characterisation of the American President is as “Commander-in-chief”. This view assumes that a President’s orders are tantamount to action. However, Neustadt has pointed out that presidential instructions are self-executing only if five conditions are met:

1. There is assurance that the president has spoken;
2. The meaning of the order is clear;
3. The orders are public;
4. The person who receives the order has the means to carry it out;
5. The general belief that the President’s order does not exceed his authority.

(Neustadt, 1960, p. 19)

The view of an executive as a commander depends on each of these preconditions being met. Neustadt has observed that in fact there are few situations in which all five occur.

Neustadt saw every American President as operating within the context of five constituencies:

1. the executive branch of government
2. the legislature
3. partisans from within his own party
4. citizens
5. foreign opinion

(Neustadt, 1960, p. 7).

In order for a President’s edict to be executed he must mobilise one or more of these groups to his cause. In certain cases a President may do this by reference to the powers of
his office. However, these cases are rare. In support of this conclusion Neustadt has offered Jonathan Daniels', a White House aide to Franklin Roosevelt, observation:

Half of a President's suggestions, which theoretically carry the weight of orders, can be safely forgotten by a Cabinet member. And if the President asks about a suggestion a second time, he can be told that it is being investigated. If he asks a third time, a wise Cabinet officer will give him at least part of what he suggests. But only occasionally, except about the most important matters, do Presidents ever get around to asking three times. (Neustadt, 1960, p.41).

The reason for this is understandable. Those who would carry out a President's desires themselves have important roles within the American government. They possess status and authority in their own right. This fact is a double-edge sword. It is precisely their power to deploy resources themselves which makes them useful to a President. Yet, the more their powers arise from the sources independent of a President, the less likely a President is to command their actions. Hence, in order to ensure that his instructions are carried out an American president must entreat legislators, cabinet ministers, civil servants, and officials of his own party to action. As an example Allison has concluded from his examination of the handling of the Cuban missile crisis during the Kennedy administration that most government actions are not the result of command, but are actually resultants "... in the sense that what happens is not a chosen solution to a problem but rather results from compromise, conflict, and confusion of officials diverse interests and unequal influences" (Allison, 1971, p. 162).

From this analysis Neustadt has concluded that persuading, not commanding, is the chief activity of American Presidents. Any President may derive enormous bargaining advantage from the authority and status of his office. However, Neustadt believes that in reality "... presidential power is the power to persuade" (1960, p.10). He views persuasion as the process by which "...someone lacking absolute control seeks to get something done through others who have power to resist" (Neustadt, 1960, p.31-32). Persuasion requires a President "...to induce them [legislators, ministers, civil servants, aides, et. al] to believe that what he wants of them is what their own appraisal of their
own responsibilities requires them to do in their own interests, not his” (Neustadt, 1960, p. 46).

Kotter (1982a) has recognised the importance of persuading within the domain of executive work in general. He has emphasised that execution is one of the most critical tasks of the executive. To him they do this by using their networks together with their interpersonal skills, budgetary resources, and information to influence people and events in some direct and indirect ways.

A superficial reading would equate persuasion to Barnard’s notion that indoctrination was one of an executive’s means of commanding. This is not so. For Barnard indoctrination is the process of changing people’s minds regarding what is in their own best interest. Neustadt understands persuasion to be a means of convincing individuals that an action is in their own best interest. As he has written “...[t]he essence of a President’s persuasive task with congressmen and everybody else, is to induce them to believe that what he wants of them is what their own responsibilities requires them to do in their interests, not his” (Neustadt, 1960, p.46).

Clearly, the distinction between persuasion and command represents opposite ends of the political spectrum from democratic to authoritarian governments. In reality most organisations fall somewhere between these two ideal types.

Neustadt has identified several features of a President which influence his ability to persuade. Obviously, the first is his authority and status. This, of course, derives from the power of the office of the Presidency and accrues to the holder of the office. However, if authority and status were sufficient in every situation, bargaining would not be necessary. Consequently, Neustadt has observed that “[c]ommand is but a method of persuasion, not a substitute, and not a method suitable for everyday employment” (Neustadt, 1960, p.32). Usually, the successful deployment of authority depends on other qualities.
Of course, the academician would insist that it is the logic of the argument which is persuasive. To this Neustadt retorts that the audience always judges the standard of discourse from their own view rather than that of its author. So, logic just as authority and status, may also be insufficient.

Neustadt believes a President's professional reputation is usually a more important advantage in bargaining than logic. Although all Presidents have the same powers in principle, no two exercise those powers in an identical fashion. If these powers are to be deployed effectively, a President must be seen to have the will to use the advantages provided by his authority and status. Out of the others' perceptions of a President's resolve emerge his opportunities to influence them. In short his bargaining advantages are improved or diminished by what others think of him. As Neustadt has written, "[reputation, of itself, does not persuade, but it can make persuasion easier, or harder, or impossible" (Neustadt, 1960, p.63).

A President's reputation is not dependent on his skill and expertise alone. Too many aspects of an executive's job are beyond the immediate control of the incumbent. Neustadt has argued that in fact presidential reputations do not arise from the "slippages and errors" in daily events, but from the appearance of patterns in a President's actions over time. For this reason presidential reputation feeds on the consistency of his word and deeds. This is why Neustadt intriguingly comments that decisions are the building blocks of reputation. This implies a spiral rather than a sequential relationship between decisions and their execution.

Another source of presidential influence is his public prestige. Congress, civil servants, his cabinet and his aides may bow to the desires of a President who has a high standing among the public. As Neustadt has written "[a] President's prestige is thus a factor in his influence of roughly the same sort as this professional reputation: a factor that may not decide the outcome in a given case but can affect the likelihoods in every case" (Neustadt, 1960, p. 92-93).
Today, it is generally regarded that personality or, at least, the image of a personality which is promoted by political advertisement is the key factor in determining the public perception of a national leader. Neustadt has argued that while it is a factor, it is not crucial because once established, an individual’s public image varies little. Instead he has suggested that constituents judge a President most strongly on the consequences that a President’s decisions have on their lives. What threatens a President’s prestige is public frustration. This observation leads Neustadt to conclude that since a President cannot control events, he must protect his public prestige by attempting to influence public hope. In short, the key to his popularity is his effectiveness as a teacher. If a President can make the public think that the hard conditions in their lives are necessary and he can make them want to endure with good grace, then his prestige will not be damaged.

Neustadt identifies four characteristics of presidential instruction:

i. The students are habitually inattentive;

ii. The instructor can expect attention from the students only when they notice public trouble pressing on their lives;

iii. The instructor teaches less by telling than by doing (or not doing) in the context that his students have established in their minds;

iv. What the instructor has previously said and done figure in that context.

(Neustadt, 1960, p.100).

In other words events give a President an opportunity to gain the attention of the nation and also provide the occasions for his teaching. Only when affairs have a direct impact on individuals’ lives will they become susceptible to his teaching. Whether his words and deeds teach the lesson that he intends depends on how the public interprets what he did before and what happens next. Thus, Neustadt has concluded “...a President’s own prospects for effective influence are regulated...by his choices of objectives, and of timing, and of instruments, and by his choice of choices to avoid” (Neustadt, 1960, p.107).

Neustadt has asserted that a President affects his bargaining advantages, his reputation, and his prestige by what he says and does. Neustadt has written:
His choices of what he should say and do, and how and when, are his means to conserve and tap the sources of his power. Alternatively, choices are the means by which he dissipates his power. The outcome, case by case, will often turn on whether he perceives his risk in power terms and takes account of what he sees before he makes his choice. A President is so uniquely situated and his power so bound up with the uniqueness of his place, that he can count on no one else to be perceptive for him. (Neustadt, 1960, p.179).

Neustadt has pointed out that it is not the common notion of information which feeds a President’s perceptions. It is “every scrap of fact, opinion, gossip” which bears on his interests. He must search widely for such information. He can assume neither that anyone or any system will supply this information nor that the information he most needs will be volunteered to him by his advisors. He then must interpret this information within a frame of reference which arises from his exposure to the details of daily operations and policies. Schlesinger has corroborated this portrait of an effective President in his study of Franklin Roosevelt’s presidency:

The first task of an executive, as he [Roosevelt] evidently saw it, was to guarantee himself an effective flow of information and ideas... Roosevelt’s persistent effort therefore was to check and balance information acquired through official channels by information acquired through a myriad of private, informal, unorthodox channels and espionage networks. At times he seemed almost to pit his personal sources against his public sources. (Schlesinger, 1959; p.522-523).

Hence, the process of understanding is crucial for a President because it alerts him to the public mood and it informs the content and timing of his decisions. These provide the foundations of both his reputation and public prestige.

Although based on the American presidency of the 1940s and 1950s, Neustadt’s work is, perhaps even more relevant today. In his account of his years as an aide to President
Clinton, Morris has described how the President used information in his battle against a Republican congress. He has written:

Clinton gave us a virtually unlimited budget for polling and mall testing. We spent months in war games figuring out how to handle different budget-fight scenarios or different Republican attacks on issues. When the hypothetical became a reality, we had only to push a button on the computer, and the mall test and the poll for that situation would pop up. (Morris, 1997, p. 147).

Morris has claimed that Clinton used this information not to shape his political position, but to ascertain on which issues he should focus at each moment. As Wills has written:

Morris learned what things to emphasise, what to neglect. Clinton wanted to talk about cutting the deficit and creating jobs, but Morris learned people either did not believe these claims or did not care about them - that it was a waste of time and money to advertise them though Clinton kept trying to. “Stop trying to get elected for the right reason. Just get elected” (Wills, 1997, p. 5).

The particular portrait of persuasion which Neustadt drew within the context of the American Presidency is reminiscent of the ancient discussion of rhetoric offered by Aristotle (1926). Aristotle suggested that arguments have three aspects. The first is the quality of the argument itself. This feature is logos from which logic, the study of the structural principles of argumentation derives. The quality of a President’s logic may have an effect on his persuasiveness, but it is likely to be limited. He will always find constituents who will use reason to support their own self interest. The second is esteem for the author of the argument. This feature Aristotle termed ethos or character. A President’s ethos has three distinct sources. He has authority and status arising from his position. He has a professional reputation among those within the government whom he must convince to do his bidding. This arises from their estimation of his skill in and determination to use the power incumbent in his office. He also has a public prestige. This is more than the personal popularity. It is a measure of his ability to make individuals believe that he will have a beneficial effect on their lives or, at least, that he is not responsible for their suffering. The third are the opinions and prejudices of the
audience. This feature Aristotle called *pathos* which refers to an appeal to the emotions. As we have seen, Neustadt believes that the professional reputation of a President depends on his ability to convince government officials that what he wants them to do is in their own best interests. His public prestige depends on his ability to convince the electorate that his policy will have a beneficial impact on their lives.

Command then is a special case of rhetoric in which the authority of the author is sufficient to insure the acceptance of his argument. However, in most cases effective persuasion requires the reputation of the author and the strength of his logic to be weighed favourably by his audience. This explains why Neustadt viewed executives as being much more dependent on persuasion than command.

Mintzberg subsumed persuading under the interpersonal roles which executives must perform. In particular the role of figurehead instantiates the executive concern with the authority and status of his office. As a figurehead an executive acts as a symbol for an entire organisation. His involvement in this role often affects his own dignity and status. As we have seen in the context of command, the leadership activity refers to the exercise of authority. However, a less limited notion of leadership includes the idea of conveying purpose to an organisation. In this larger sense the leadership role corresponds closely with Neustadt’s notion of professional reputation.

Similarly, Mintzberg’s impression of liaising is very similar to Neustadt’s concept of public prestige. The liaison role refers to the relationship that an executive manages with individuals outside his own organisation. He undertakes this activity in order to gain intelligence about his environment. More importantly, dealing with constituencies outside his organisation also strengthens his own status. This in turn improves his ability to persuade because it provides him with a better understanding of his customers, shareholders or constituents. This in turn may improve his professional reputation within the company. The action of promoting the organisation to the outside world may also increase his public prestige. Both of these actions may reinforce his authority and status.
2.4 Summary
The chapter has defined the term executive and examined the research on the nature of executive work. It then summarised the development of executive work, looking into the concepts introduced by writers of the classical school up to the more recent empirical studies. A summarisation of all these works is then developed to produce a model of executive work. Since the aim of this research is to develop and to test a method of EIS benefits management, the model is necessary in order to assess the role of information in executive work. This understanding will be a basis for the development of generic benefits models of EIS which will be the focus of the next chapter.
CHAPTER 3:

EXECUTIVE INFORMATION SYSTEMS

3.1 Introduction

The characterisation of executives adopted in this dissertation implies that they play crucial roles in the lives of their organisations. They have ultimate responsibility for its day-to-day operation, but also must set its future course. They may at any time have to deal with any member of the organisation, but they also serve as the face of the organisation to the world at large. The research concerning the nature of their work surveyed in the previous chapter suggests that executives’ tasks are varied, often harried, unstructured, and extremely fragmented. Hence, executive work should offer a domain rich in potential for the application of information technology. Since their advent in the early 1980s, executive information systems have offered the mechanism for realising this promise.

Rather than revolutionising executive work, the history of EIS offers an ongoing case study of the issues summarised in Chapter 1 - the difficulties of realising the benefits of IT. The often-cited advantages of EIS, such as better decision making, are mostly qualitative. Few are palpable. Thus, cost benefit analysis and other financial techniques which rely on measurement offer meagre insights. Rockart’s and DeLong’s survey (1988) of 30 American companies which have used EIS illustrates this point. Not a single one of these businesses had performed a cost benefit analysis either before or after implementation of their EIS. Yet, despite their intangible nature, EIS benefits need to be managed rigorously if they are to be realised. As Rockart and DeLong (1988) have argued, EIS need systematic management to ensure that they deliver the promised benefits because they are risky and expensive, not in spite of the fact.

It is not simply the benefits of EIS which are qualitative. There is little about EIS which is tangible, quantitative, and measurable. There is no agreement within either academia or industry as to the constitution of an EIS. Therefore, this chapter reviews the literature on
executive information systems in order to arrive at an understanding of their essence. It argues that there are, at least, three distinct notions of EIS.

i. As tools for scanning and searching for information
ii. As tools for aiding decision-making
iii. As tools for supporting communications

Each of these conceptions of EIS entails different features.

This preliminary work provides a context for a discussion of the benefits of EIS. This examination has two phases. First, the chapter summarises the existing studies into the nature of EIS benefits. They represent the opinions of executives who have used EIS beneficially. Secondly, the chapter proposes a model of EIS benefits which is based on the information processing theory of organisations and which is supported by a number of studies of the relationship between information use and organisational performance. This artifice makes the relationship between the three types of EIS, and explicit benefits clearer. The chapter concludes with a survey of studies which have identified impediments to the realisation of IT benefits. This final section maps these impediments against the six different categories of executive tasks - an activity which suggests the kind of impediments to which each type of EIS is prone.

3.2 What is an EIS?
The literature reveals no commonly agreed definition of EIS. This can be seen from Table 3.1.

TABLE 3.1: EIS Definitions

<table>
<thead>
<tr>
<th>Definition</th>
<th>Source</th>
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<tbody>
<tr>
<td>i. Intensely data-oriented systems designed to provide information for executive use to improve managerial planning, monitoring and analysis</td>
<td>Rockart and Treacy, 1982</td>
</tr>
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<td>ii. Terminal-based systems designed to aid senior executives in the management of the firm</td>
<td>Levinson, 1984</td>
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### Definition

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<tr>
<th>Definition</th>
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<td>iii. The routine use of computer-based system, most often through direct access to a terminal or personal computer, for any business function. The users are either the CEO or a member of the senior management team reporting directly to him or her.</td>
<td>Rockart and DeLong, 1988</td>
</tr>
<tr>
<td>iv. Computer-based information delivery and communication systems for senior managers</td>
<td>Paller and Laska, 1990</td>
</tr>
<tr>
<td>v. Computerised system that provides executives with easy access to internal and external information that is relevant to their critical success factors</td>
<td>Watson et al. 1991</td>
</tr>
<tr>
<td>vi. An information system used to support or shape the competitive strategy of the organization</td>
<td>Romanyi, 1991</td>
</tr>
<tr>
<td>vii. Information intensive system that is designed to support the decision-making of the most senior executives in a large organisation</td>
<td>Whymark, 1991</td>
</tr>
<tr>
<td>viii. An EIS deals with all of the information that helps an executive make strategic and competitive decisions, keeps track of all the overall business and its functional units and cuts down on the time spent on routine tasks performed by an executive</td>
<td>Thierauf, 1991</td>
</tr>
<tr>
<td>ix. A system that integrates information from internal and external data sources enabling executives to monitor and request information of key importance to them via customised presentation formats</td>
<td>Millet and Mawhinney, 1992</td>
</tr>
<tr>
<td>x. An EIS is an information system supported by mainframe or personal computer, used for various business functions on a current basis. The users are either the CEO or a member of the senior management team reporting directly to him or her. The system is designed specifically for them. It can support various communication, planning and control functions and provide access to relevant information of a general nature</td>
<td>Bergeron and Raymond, 1992</td>
</tr>
<tr>
<td>xi. Computerised tracking of essential data of a business daily performance for executive planning and decision making</td>
<td>Moskowitz, 1995</td>
</tr>
<tr>
<td>xii. System to support executives in their very broad and general task to tackle key business issues with computer assistance. This assistance consists of the provision of both information and functions (e.g. drill-down, exception reporting, what-if analysis and e-mail) in an integrated way</td>
<td>Grundwald and Vodogel, 1996</td>
</tr>
</tbody>
</table>
Researchers have emphasised different aspects and functions of EIS. Although the concept is more than a decade old, there is still confusion among practitioners and researchers about what constitutes an EIS. Imprecise terminology used by software vendors and researchers alike exacerbates the situation. Software vendors, for example, promote a wide range of software packages for modelling and reporting under the label, 'Executive Information System'. Even the term EIS itself is uncertain. Levinson (1984) has offered the alternative, Executive Support System (ESS). However, Rockart and DeLong (1988) have suggested that ESS should be restricted to systems with a broader set of capabilities in addition to information services. Similarly, Thierauf (1991) has written that an ESS is an extension to EIS. In agreement with this, Watson et al. (1991) have conceptualised ESS as including capabilities such as support for electronic communications, data analysis capabilities and organising tools. However, to some researchers, the term used is not important. For example, Paller and Laska have written, "What these systems are called does not really matter. What does matter is what they can do. John Rockart and David DeLong, early pioneers in the field, called them ESS; we call them EIS. You may call them anything you choose" (1990,p.2).

Although a few researchers have adopted this stand, this is not very satisfactory. Having an inconsistent terminology will only lead to confusion as each term connotes different meanings to different people.

Confusion between EIS and management information systems (MIS) is also common. Millet and Mawhinney have suggested that EIS is an MIS for executives. This is reflected in their definition of EIS, which is; "A system that integrates information from internal and external data sources enabling executives to monitor and request information of key importance to them via customised presentation formats" (1992,p.85).

They have claimed that the literature indicates executives use computers for reporting rather than analysing. This supports their view of EIS as assisting in monitoring. They have substantiated this claim by stating that the experts they interviewed used EIS predominantly for monitoring. This view, however, is not unique or new. Moore,
interpreting results from his studies of executive computer use, has consequently suggested that an EIS is a type of executive MIS. He has written:

Top-most managers are the most remote from the firm’s operations and crave status information, opting to use the new medium of the computer for status reports. For them, planning, analysis, and other decision-support tools are less vulnerable because the nature of their planning task is strategic with less structure, vague or conflicting measures of performance, and longer time horizons. Their information needs for decision support are soft (qualitative) and often require external data (competitor behaviour, regulatory and political actions, and social factors) not readily available from within the firm. As a result, their planning-oriented tasks are not a good fit for most common applications of a budget-focused spreadsheet model. Hence, top executives use the new medium more frequently for structured applications of MIS. (Rockart and DeLong, 1988, p. 21-22).

Watson et al. (1991) hold a similar view of EIS. Based on their study of fifty companies, they have concluded that EIS are developed as a result of pressures for timely information. They have found that the EIS in 88% of the companies provide current status information and almost all have access to external databases. These findings thus reinforce their definition of an EIS as, “computerised system that provides executives with easy access to internal and external information that is relevant to their critical success factors.” (Watson et al. 1991,p.14).

Moskowitz’s (1995) view echoes that of Watson’s et al. To Moskowitz, tracking performance data of the organisation and tapping external data sources such as business data bases or trade news are the main roles of an EIS. These help executives in understanding changing market conditions and assisting them in shaping the company’s best possible response.

This perspective of EIS as MIS for executives draws largely from the opinion that executives’ main role is to monitor and to be aware of what is going on in and around the organisation, to make sense of things and to translate these interpretations of the internal
and external environment into appropriate actions. Hence from an MIS perspective, EIS provides broad-based information for performance monitoring and environmental scanning and assists executives in identifying potential problems. This is thus different from a decision support system (DSS). A DSS's main purpose is to help managers analyse and solve problems. To this effect Martin (1989) has written:

Executive information systems are specifically designed to help executive gain insights and track critical success factors. The focus of an EIS is to aid a decision maker in assimilating information quickly and identifying problems or opportunities, not as an aid in problem analysis or resolution. (p.50).

However, there is no consensus on this. Meiklejohn and Harvey (1989) have observed that some companies develop EIS with the objective of helping executives' decision-making abilities. They have given the example of an EIS in ICI, the British chemical conglomerate. The EIS has some modelling features to help executives to analyse decisions. They have quoted Sir John Harvey-Jones, ICI’s original executive sponsor of the EIS:

I want to do things with the information that other people may consider crazy. Currently, if I have a business simulation I want played, then being the chairman it will get done. However, in the process several people get inconvenienced, and by the time the model has been run and the results have been presented I have moved onto something else. I need a system that will allow me to play these what-if models in the privacy of my own office, inconveniencing nobody but the computer. Nine times out of ten all I will need is a back-of-the-envelope solution to indicate whether I am going in the right direction. (Meiklejohn and Harvey, 1989, p.52).

Rockart and Treacy (1982), the early pioneers of EIS, while stating the use of EIS for planning and monitoring, have also emphasised its manipulative and analytical capability. They have suggested that executives not only use EIS to access status reports but also have the capability of doing some personalised analysis. Depending on executives, the
analysis may take the form of some simple extrapolations of trends or elaborate simulations to help in strategic decisions.

It is views like these which have led Rockart and DeLong (1988) to suggest that the early EIS literature understood these systems as an extension of the data-driven decision support system (DSS) concept. They have written:

In the early ESS literature there is a clear bias (towards DSS). In their work Rockart, Treacy, Scott Morton, Levinson, and Keen all saw ESS as an extension of a data-driven DSS concept. Despite attempts to distinguish executive support system from DSS, the few successful systems they observed bore remarkable similarities to DSS. (Rockart and DeLong, 1988, p. 17).

Drawing from literature on DSS, they have reported three major distinguishing features of DSS:

i. orientation to a single decision maker, or class of decision makers faced with a specific semi-structured decision;

ii. the decision is repetitive, justifying large development costs;

iii. the system is model-oriented and data-intensive.
   (Rockart and DeLong, 1988, p. 17)

This may be compared with EIS which serves a different clientele in organisations, the top executives, whose broader, more diffuse roles require systems quite different from the DSS which serve their subordinates.

Rockart and DeLong have concluded that the major ways EIS differ from lower-level DSS are:

i. the application set, which constitutes EIS, may include a range of capabilities such as internal and external monitoring, communication and limited analysis;
ii. the software utilised, which may include products specifically designed for executive use;

iii. the implementation process, which may face a new set of problems such as getting access to multiple sources of data which may not readily be available for technical or political reasons; defining executive requirements, which may be limited by access to executive users;

iv. the organisational impact of the system, which may be more far-reaching than the generally departmental DSS. (Rockart and DeLong, 1988).

Whymark (1991) has argued that no matter how it is viewed, the process of management is fundamentally one of decision-making, and the process of making decisions and acting on them is the business of management. Thus, any executive support system must contribute something to the decision-making process. It must either enable the executive to be more efficient at decision-making or enable him to make more effective decisions. Based on this reasoning, Whymark has argued that an EIS in providing the various information needs of executives, is a form of DSS.

Definitions in Table 3.1 suggest that EIS have not only been described as information and analytical support systems but have also been frequently quoted as providing assistance with communication and office automation. Even in the early days of the concept, these capabilities were recognised. For example, Levinson (1984) has noted a communication element in some systems. Perhaps, this is the reason he uses the term ESS instead of EIS. Rockart, who earlier defined EIS as having monitoring and analytical functions, later changed his definition to include all other support features needed by executives. Together with DeLong, he has defined EIS as, “The routine use of computer-based system, most often through direct access to a terminal or personal computer, for any business function” (Rockart and DeLong, 1988,p.16).

Paller and Laska (1990) and other later researchers such as Bergeron and Raymond, (1992), and Grunwald and Vodegel (1996), all add communication capabilities in
addition to the information support provided by EIS. From Edwards and Peppard's (1993) classification of EIS, it is also clear that communication and personal support are taken to be important features of EIS.

The inclusion of communication support recognises the crucial social role of executives. It makes it clear that executives not only monitor performance and make decisions, but also must communicate them. They operate in conjunction with and through other executives and staff. Visions and goals need to be made known and issues and problems need to be discussed and deliberated. Using communication facilities, they can easily disperse visions and priorities throughout the organisation. This will improve interactions between colleagues and subordinates. As a result, the sharing and exchanging of ideas should improve.

An EIS can not only improve communications in a direct physical sense but also in the sense of making the contact between the executives and others more fruitful. Meiklejohn and Harvey (1989) have pointed to a 'persuasive' aspect of EIS. They have stated that it is important not to underestimate this aspect as "executives spend far less time making decisions than they do implementing them" (Meiklejohn and Harvey, 1989, p.75). According to Meiklejohn and Harvey, executives spend much of their time sharing and communicating their vision to colleagues, subordinates and the world outside, persuading them of its correctness, and motivating them to "make it happen". They quoted an executive in their survey who said, "My job is political, to persuade people, to take other people with me. So the simpler and clearer the presentation of information the better" (Meiklejohn and Harvey, 1989, p.56).

As this review shows, there is no agreed definition of EIS. In fact the literature betrays three distinct themes with regard to EIS.

The first is that of an electronic means by which executives can retrieve information. This facility allows them either to browse through information without a particular problem to solve (Aguilar, 1967) or to search for a particular piece of needed information (Huber, 1991). This view corresponds to the belief that an EIS is an MIS for executives.
Rockart and Treacy who first defined EIS seemed to have this notion in mind. However, Millet and Mawhinney have provided the best definition of an Executive Retrieval System (ERS): “A system that integrates information from internal and external data sources enabling executives to monitor and request information of key importance to them via customised presentation formats” (1992).

The second is that of an electronic means of assisting executives in making unstructured or semi-structured decisions (Gorry and Scott Morton, 1971). This facility allows them to create simulations of their problems. This requires mechanisms for building and executing computer models and a means of retrieving data as raw material for the model or as validation of the model (Silver, 1991). This view corresponds to the belief that an EIS is a DSS for executives. Rockart and Delong were the first to articulate this notion of EIS in their book *Executive Support Systems* (1988). Here they distinguished between an EIS which was data-oriented (i.e. its primary function was scanning and searching) and an Executive Support System (ESS) which was model-oriented (i.e. its primary function was modelling and simulation). However, the idea of (ESS) had its roots more than a decade earlier in the work of such authors as Gorry and Scott Morton (1971), Keen (1975), and Alter (1977). Nevertheless, Whymark has provided the best definition of an ESS: “Information intensive system that is designed to support the decision-making of the most senior executives” (1991).

The third is that of an electronic media by which executives may communicate with people inside and outside of their organisation. This facility allows them to exchange electronic messages in the form of text, graphs, pictures, *etc.* This view corresponds with the belief that an EIS is an electronic mail system for executives. The inclusion of communications as a prime feature of EIS was an afterthought. By the 1990s many existing ERS and ESS began to incorporate this feature. Levinson (1984) may have been the first to recognise this aspect of EIS. However, Paller and Laska (1990) have provided the best definition of an Executive Communication System (ECS) as a “computer-based information delivery and communication system for senior managers.”
The existence of these three distinct notions of EIS helps to explain the lack of a standard definition. This dissertation adopts the convention that EIS is a generic term. EIS, therefore, refers to ERS, ESS, and ECS as well as any combination of these. For this reason EIS requires a less specific definition such as that offered by Grunwald and Vodegel: “[A] System to support executives in their very broad and general task to tackle key business issues with computer assistance” (1996).

Having defined this categorisation of EIS, it is now possible to suggest the impact that EIS might have on executive work. An ERS has direct relevance to the view that learning is the prime task of an executive. The literature on ESS assumes that decision making is the essence of executive work. While little has been written about ECS, they clearly have an effect on implementation either by means of direct command or by persuasion. Since ECS provides the means of interacting with groups, one should be able to combine it with an ERS in order to improve the activity of sensemaking within a group of executives. Alternatively, one should be able to combine it with an ESS in order to improve the activity of bargaining.

3.3 What are the distinctive features of EIS?
There are five characteristic features of EIS. Three of them determine the three categories of EIS - information retrieval, decision support, and communication. They are improved information, modelling and simulation tools, and electronic communications. The fourth feature is the ability to integrate any information, models, and messages which arise from the base capabilities. The fifth is an easy-to-use interface which encompasses the entire system. Figure 3.1 shows the architecture for an EIS which relates all five features.

3.3.1 Information
The crucial feature of an ERS is the capability to assist an executive in scanning and searching. An ERS does this by speeding access, by offering improved information, and by supplying tools for analysing this information.
Electronic access to information does not necessarily result in swifter retrieval. Browsers, filters, and keyword search techniques expedite scanning and searching. The ability to integrate and to manipulate information from a variety of sources speeds complex inquiries. An interface which is easy to use and which presents information clearly and understandably also hastens access. For example, the use of exception reporting allows an executive to identify problems more quickly.

The improvement in information takes several forms (Bergeron and Raymond, 1992). First, the information is novel. That is to say that it is unavailable from any other source. Often, this means that the information can only be gathered by hand, but it would be too costly or too time consuming to do so. Hence, an executive is able to consider information which would not be available otherwise (Silver, 1991).

Secondly, observation of executives have found that the information which they use comes from a wide variety of sources (e.g. Mintzberg, 1975). Authors have categorised these sources simplistically as those from outside and those from inside the firm. The internal information on performance and finance may come from “transaction processing systems, financial reporting systems, commercial information sources, text files, and manual data collection” (Vandenbosch and Huff, 1997). However, academic studies
consistently find that executives rely more on external than internal information (Aguilar, 1967; Keegan, 1974; El-Sawy, 1985). This may well be because executives have responsibility for shaping an organisation's response to environmental change. Information indicating a need to change is most likely to come from outside, not inside, a company. Hence, an ERS should draw external information from an even wider variety of sources including public databases, trade figures, news services, competitor analyses, and government departments (Young and Watson, 1995). More recently, ERS have incorporated access to the World Wide Web.

Thirdly, Mohan et al. (1990) have argued that an executive who has access to detail and a good understanding of it can change employees' behaviour. Rockart and Delong (1988) have offered the Banco Internacional as an illustration of this adage. The information available to executives is often highly summarised and so may obscure more than it clarifies. An ERS should hold complete information and allow an executive to select the level of aggregation which is most useful to him.

Fourthly, Mohan et al. (1990) have pointed out that another feature of making complete information available to an executive is a reduction in bias. Huber (1982) has described the mechanisms by which the content of a message may be distorted as it is passed upward in a hierarchy. An executive who has access to the raw data upon which the message was based will be immune to deception.

Fifthly, the process of summarising information takes time. Therefore, executives rarely have up to date information. More timely information may result in faster response to problems and opportunities. In a survey of 260 American managers in the public sector Kraemer et al. (1993) have found a strong correlation between the currency of the data found in their EIS and their perception of the system's utility.

Finally, the ability to filter and to aggregate information results in information which is more relevant to an executive. Often, executives have received a mass of information which is not tailored to their individual needs. Reports which take the form of a pile of computer printouts are the best known example, but manually prepared information may
not be an improvement. The ability to filter unwanted information means that executives can limit the information which they see to that which is relevant.

The previous paragraphs have alluded to some of the tools for analysing information which are central to an ERS. This feature allows executives to interrogate the information. The capability to browse, filter, or to perform keyword searches helps an executive place specific data into a wider context. The ability to abstract and to “drill down” into details is critical in exploiting more complete information. An ERS might even allow for statistical summarisation. However, in general it is the ability to prepare ad hoc inquiries which is the essential analytical tool. Traditional MIS revolve around predefined, standardised reports (Silver, 1991). These rarely respond to the needs of executives because they are static. Executives need a more interactive means of inspecting information.

3.3.2 Modelling and Simulation

The crucial feature of an ESS is the capability to assist an executive in modelling and simulation. An ESS does this by providing a simple means of creating, manipulating, and executing models.

Simulation models are essential in an ESS. They allow executives to build a planning model, to vary its inputs, and to examine its corresponding outputs. This enables an executive to explore alternative business scenarios before making his decision. The input to the simulation may be actual financial or performance information for the organisation. This activity is popularly known as “What if?” analysis although to mathematicians it is referred to as parametric or sensitivity analysis (Silver, 1991).

Simulation models are fundamental to an ESS because most decisions which executives make are semi-structured or unstructured. “What if?” analysis is the most effective means of dealing with this class of problems. The word “support” implies that the system should assist executives to exercise their judgement and not to make the decision itself. The choice of word reflects the nature of the most common types of decisions made by executives. Nevertheless, an ESS may include other types of mathematical
modelling techniques such as regression analysis, time series forecasting, and optimisation methods (Silver, 1991). These tend to be more proscriptive and so are less useful to executives.

An ESS might also provide analytic tools for assisting executives in selecting among alternatives. As Silver writes:

A decision aid that supports choosing one of many alternative solutions might help users scan relevant databases in search of viable alternatives, display the alternatives and their associated data in tabular form, produce graphical comparisons of the alternatives, allow users to identify alternatives which they want to eliminate, select a winning alternative by applying user-defined mathematical formulae, and implementing other, more sophisticated methods for choosing alternatives. (1988, p. 11)

Young (1989) has suggested that an even broader view should be taken of executive support which includes idea processing features.

3.3.3 Communication

The crucial feature of an ECS is the capability to assist an executive in exchanging information within and outside his organisation. An ECS does this by providing a simple mechanisms for electronic mail, voice mail, and/or video conferencing.

The global spread of the Internet and other modern communications links makes it easier to deal daily with people who are geographically removed from an executive. The ability to communicate asynchronously which is inherent in both e-mail and voice mail make it possible to converse with people in a time delayed fashion. This can facilitate the co-operation and co-ordination within and between organisations.

However, electronic communication is not simply an alternative means of conducting a conversation. An attachment facility within e-mail allows reports, diagrams, and pictures to be appended to any communication. Fax, when associated with voice mail offers the same potential. Of course, video conferencing allows presentations of large quantities of
information to be made at great distances as if the audience were in the same room as the speaker.

Moreover, communication may be not simply bi-directional, but may include a large group. List servers allow e-mail to be broadcast to a mailing list of indefinite size. Bulletin boards and chat groups offer an alternative means. Of course, the idea of serving a community is inherent in the concept of video conferencing.

In addition any communication systems usually includes a means of message management which allows messages to be filed, sorted, reused, and archived. This can greatly reduce the problems of disseminating and administering information.

3.3.4 Integration

Integration is a critical feature in any type of EIS. Integration implies that not only is information captured within an EIS, but relationships between information are stored as well. For example, an ERS may store performance information at the individual unit level and it may also store information concerning the hierarchical relationship between units. This allows the performance information to be aggregated at the level of groups, departments, business units, or divisions. Likewise, an EIS which incorporates both an ERS and ECS should be able to attach charts of information prepared within the ERS to messages sent by means of the ECS.

The database concept is the feature which makes integration possible. Martin has described a database as, “a collection of interrelated data stored together without harmful or unnecessary redundancy to serve multiple applications; the data stored so that they are independent of programs which use the data” (1975,p.22). Since an EIS contains not just simple, structured data, but may also include pictures, sounds, graphics, and documents, they must depend on heterogeneous database technologies which allows a variety of types of information to be included.
3.3.5 Interface

The interface to an EIS should be simple to use, highly flexible, consistent in its performance and instructive. An easy to use interface is probably the most frequently mentioned characteristic of an EIS. This is undoubtedly because without a simple interface an executive is unlikely to use it. Because an executive's day consists of short periods of time between interruptions, an EIS must be easy to learn and to use. In fact Kraemer et al. (1993) have found in their study of American public sector managers that those who find their MIS most useful are those who are indirect users. That is they request information from specialists who use their MIS in response to the request. This suggests that many managers would rather not learn to use their MIS and that those, who do learn, do not feel that they have gained its full advantages. This outcome is even more likely among executives.

One of the essential features of an interface is that it should allow for the presentation of information in a variety of formats - tables, graphics, or even animations. Colour is another desirable feature because it allows good or bad news to be highlighted (Silver, 1991). Another important aspect of the interface is that it allows the executive to control the display. This means that he can switch easily from one form of display to another or from one colour, shade, or scale.

It might be argued that ideally an executive should be able to control his EIS by spoken command. Many systems currently on the market work by means of touch sensitive screens. However, EIS built specifically for individual organisations often use the standard mouse driven window-based system. The IIT institute has categorised the interfaces as shown in Table 3.2

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled Reports</td>
<td>Batch Oriented</td>
</tr>
<tr>
<td></td>
<td>Predefined, prepared reports</td>
</tr>
<tr>
<td></td>
<td>Not flexible</td>
</tr>
<tr>
<td></td>
<td>No Interaction required</td>
</tr>
<tr>
<td>Questions and Answers</td>
<td>Interactive, Ad hoc in nature</td>
</tr>
</tbody>
</table>
Menu Driven | User friendly  
|----------------|
| Step-by-step procedures  
| Usually consists of common, predefined reports  
| Prepared for users  

Command Language | Predefined short codes must be learned by users  

Natural language | Regular English is used to interact with EIS

**TABLE 3.2: Categories of User-Interface**

Whichever approach to interface design is employed within an EIS, consistency of command is crucial. An executive must be able to invoke the same command in the same way regardless of the context. This principle should also extend to similar commands. Moreover, when an executive makes a request incorrectly, the system should provide a message which explains the reason for the error and should suggest a correct means of achieving the desired outcome. When an executive is uncertain as to how to proceed, it should be easy for him to request help.

The architecture for an EIS presented in Figure 3.1 incorporates the essential features of ERS, ESS, and ECS. This is apparent from Figure 3.2 which provides the more elementary architectures for each of these three categories of EIS. A basic ERS must include both an easy to use interface and improved information. An ESS must incorporate modelling and a simulation capability encased within a simple interface. An ECS simply provides electronic communication by means of an easy to use interface.

Most EIS are more complex than these simple components. For example, most ERS integrate the information (particularly, that which is internal to the organisation) available to them within a database. This allows the relationships among different information to be presented and makes drill down features and aggregation possible. ERS which support executive learning have just such an architecture.
A database also provides standard definitions and interpretations of information. This means that the information can be viewed by all who share the same context. This assists greatly in the process of group learning. Moreover, the ability to use electronic communications may also expedite this process by allowing asynchronous interaction on a wide geographic scale. When added to the basic ERS, integration and communications offer a potentially valuable tool for sensemaking.

In practice ESS almost universally include a facility for focused search. They may also incorporate other aspects of an ERS such as improved information and databases. Group decision support systems (GDSS, 1991) usually consist of these basic features as well as a means of local communications. GDSS can support the bargaining among executives.

The same ERS which assists an executive in learning may also support him in commanding. However, when communications and integration is added, the resulting EIS can support persuasion both inside and outside of an organisation.

Hence, different types of executive activity require different combinations of these five characteristic features of an EIS.
3.4 What are the benefits of EIS?

3.4.1 Empirical investigations of EIS benefits

As with the definition of EIS, there is no agreement on their benefits. Empirically, users experience different benefits from the use of their EIS. As an illustration of this point, Rockart and Treacy have offered a sample of executive impressions of EIS:

The system has been of infinite help in allowing me to improve my mental model of the company and the industry we’re in. I feel much more confident that I am on top of the operations of our company and its future path.

Your staff really can’t help you think. The problem with giving a question to the staff is that they provide you with the answer. You learn the nature of the real question you should have asked when you muck around in the data.

Comparing various aspects of our company with the competition is a very fast way of defining the areas in which I should place most of my attention. The system allows me to do exactly that.

I bring a lot of knowledge to the party. Just scanning the current status of our operations enables me to see some things that those with less time in the company would not see as important. Although the resulting telephone calls undoubtedly shake up some of my subordinates, I think in the long run this is helpful to them, too.

Frankly, a secondary, but very real, advantage of the use of the system by me is the signal it gives to the rest of the company that I desire more quantitatively oriented management of the organisation. I want my subordinates to think more analytically, and they are. I feel we’re on the way to becoming a significantly better-managed company.

(Rockart and Treacy, 1982, p. 86).
Among the benefits we can gather from these various impressions are increased understanding of the businesses, the ability to share information between executives, improved analytical ability, more exact analysis of competition, better monitoring of company’s status and performance and more encouragement of staff to improve.

3.4.1.1 Learning benefit

Rockart and Treacy (1982) have suggested that the most significant benefit of EIS is that it offers executives better understanding of their companies and industries. EIS help to broaden executives’ outlook, challenge their preconceptions and provided them with more insights into their businesses. They have observed the use of an EIS at Northwest Industries. The president of that firm confirmed that EIS assisted him in understanding the business problems and issues. He has said “[t]he system provides me with an improved ability to ask the right questions and to know the wrong answers” (Rockart and Treacy, 1982, p.86). One of the findings of a telephone survey made by Rockart and DeLong (1988) of executives at 30 US companies is that the major benefit of EIS is in allowing executives to develop richer, more up-to-date and more sharply defined mental models of their business environments.

Better mental models are attributed to:

i. improved access to external data;
ii. greater ability to combine data from multiple sources;
iii. more meaningful presentation.

By providing external data and by allowing faster and more timely access to both internal and external information, EIS enable faster scanning, providing early warning indicators of potential problems (Leidner and Elam, 1995). Combining data from multiple sources enables executives to explore new relationships and improve their grasp of the business. They will be able to correlate internal and external information and integrate these together into a single model to see the trends. Presenting data in flexible formats, combining text, numbers and graphics, helps many executives understand their businesses by highlighting trends they might not have recognised with just tabular data.
A president of a bank which Rockart and DeLong surveyed, indicated that he had developed a much different sense of the dynamics and trends in his business through browsing current information of customer accounts. The CEO of a high technology firm said he learned of his firm's operations and adjusted his thinking accordingly by using models of the interaction between the firm, the industry and the United States economy. Meiklejohn and Harvey (1989) have quoted comments made by a chief executive of a UK firm, "At the end of the month we sit down and go through the system to find out what is going on. The trend picture is the only important thing. The graph tells you whether there is an underlying trend, or it's just one month's variation" (p. 49).

Leidner (1996) has tested the relationship between EIS use and mental model enhancements among 86 Mexican executives. The hypotheses tested were part of a survey to find out the impacts of EIS use on Mexican managers and their organisations. Leidner has measured the enhancement of mental model by asking the executives the extent to which the EIS has had the following benefits:

i. a better understanding of important trends, clearer sense of where things are going;
ii. a sharper vision and increased understanding of the business;
iii. better insights into the problems and opportunities facing the organisation.

The survey supported the hypothesis. Fast and timely access to both internal and external information played a significant role in realising the benefit of improved mental model. Meiklejohn and Harvey (1989) have reported on an American international bank using EIS not only to monitor its financial activities but also to learn and understand the political developments of countries it has business with and to study the profiles of its international customers. They have also quoted a British Airways executive who has noted that one of the major benefits of the EIS in British Airways was the ability to give fresh insights. He said, "The system improves the quality of your thinking and decision making; it helps you to make connections you would previously not have done. It enables you to scan more data already sorted to make it assimilable. There is an awful lot to these sorts of system that, by structuring the material right, not only helps you to answer the question you started with, but to pose another one as well" (p. 85). The benefit of an EIS
can thus be that executives understand their organisations and their environments better and become more investigative.

3.4.1.2 Sensemaking benefit

In their study of EIS use over several years in public and private organisations Paller and Laska (1990) have observed EIS may assist the executive in defining, highlighting, and reinforcing a specific vision of organisational priorities. This fosters a shared vision throughout the organisation. It happens in several ways:

i. by defining and prioritising the data and functions to be included in an EIS, the executive indicates his priorities and helps to institutionalise them;

ii. by making the EIS data available to others in management, the performance of key sectors of the firm is readily visible;

iii. by highlighting the people responsible for success, an EIS can improve commitment;

iv. by providing everyone with quality controlled data at the same time, everyone is using the same facts to make decisions;

v. by improving communication through applications such as electronic mail, an EIS can speed up the development of consensus within the management team;

vi. by providing access to outside information sources, executives can broaden the perspectives of their top management team and tailor their viewpoint of the competitive environment.


This assistance in creating a shared vision or team building is an important benefit as it is the responsibility of executives to steer the organisation in the same direction. With the capabilities of improved communication through mailing facilities which form one of the components of most EIS, the task of team building will be enhanced further. Improved
communication has been quoted by most EIS researchers as being one of the impacts of EIS implementation (Rockart and DeLong, 1988; Paller and Laska, 1990; Rainer and Watson, 1995). In fact, according to Paller and Laska, many corporations have found that the electronic mail capabilities of their EIS are more than enough to justify the entire system. From these descriptions, EIS clearly play an important part in helping executives in their sensemaking role. To illustrate this Paller and Laska (1990) have quoted the example of the U.S. Government Printing Office (GPO). It is responsible for printing and distributing hundreds of millions of documents and in the mid-1980s was having performance problems due to labour unrests and to changes of leadership. The situation improved in the late 1980s and its chief executive officer contributed much of the success to the EIS. The system monitors the data necessary to tell how well the organisation is meeting the goals set up by top management, displaying quality and responsiveness indicators throughout the organisation. Paller and Laska have summed up the example, “GPO’s executive information system demonstrates that when lower-level managers know what senior management expects of them, and can see how well they are doing, they do their jobs well” (Paller and Laska, 1990, p. 15). Belcher’s and Watson’s study of Conoco (1993), has indicated a similar benefit. They assessed the value of the company’s EIS. The study was comprehensive and carried out very systematically using semi-structured interviews and an analysis of the data collected. Those interviewed said the EIS unified the people in the company and served as an essential link between management and employees. The comments made by one manager epitomise this view, “I had EIS made accessible to my group so they would have the chance to feel a part of the operations. This has been a big boost to the morale of the group - an unquantifiable value” (Belcher and Watson, 1993, p. 249). Similarly, Meiklejohn and Harvey (1989) have cited an executive who believed that his company’s EIS had resulted in “stimulation of debate rather than things just going through on the nod. The system clearly encourages the sharing of data between executives” (p. 51).

3.4.1.3 Satisficing

One of the most quoted benefits of an EIS is that it improves executives’ decision making. With multiple sources of information, internal and external, EIS helps in making executives feel more confident about their decisions. This comes about as
information reduces the ambiguity of the decisions (Paller and Laska, 1990). The system gives executives the opportunity to accumulate information about possible future trends and hence, to take some of the risks out of those decisions. Another aspect of decision making is the speed with which decisions are made.

Depth of analysis also improves decision making (Leidner, 1996; Leidner and Elam, 1995). EIS may help executives analyse by providing real-time information and additional analytic capabilities, such as drill-down facility and trend analysis.

Studies by Leidner and Elam (1995) and Leidner (1996) have specifically examined the impact of EIS on decision-making. They have measured improvement in decision making in terms of the speed and the extent of analysis. They proposed two hypotheses:

i. the more frequent the executive’s use of EIS, the faster the speed of the decision making and the greater the extent of analysis in decision-making;

ii. the greater the length of the executive’s use of EIS, the faster the speed of the decision-making and the greater the extent of analysis.

Their research supported both hypotheses. The use of EIS speeds the decision making process and increases the analytical quality of the decision. Leidner’s study of Mexican executives confirmed this a year later. Real-time information leads to faster decision-making and analytic features allow for simultaneous consideration of multiple alternatives. Executives obtain answers more quickly and spend less time in meetings. They measure the extent of analysis by studying whether the executives:

i. spend significantly more time analysing data before making a decision;
ii. examine more alternatives in decision making;
iii. use more sources of information in decision making.

Other studies that support the decision making impact of EIS are Rainer’s and Watson’s (1995), Preedy’s (1990) and Whymark’s (1991). Rainer and Watson have studied 48
individuals involved with the development and use of EIS. Eighteen were executives. The rest were EIS developers and consultants. The subjects came from seven different firms in varied industries. The survey attempted to identify factors that were important for successful development and operation of EIS. Though it did not specifically looked into the issue of EIS impacts, anecdotes from the interviews with the executives did point out several benefits that they obtained from using EIS. The provision of timely, accurate and relevant information helped in responding quickly to problems and hence speeded up their decision making:

I have to have timely information to react quickly to problems. Before I had my EIS, I depended on my sneaker networks ...you know, guys running up and down stairs with computer printouts...for information I needed on a flash basis. My EIS is faster (Rainer and Watson, 1995, p.153).

Preedy has highlighted the improved decisions of a large American food manufacturer which used EIS. The system provided the company with comprehensive information on its performance throughout the regions and highlighted the discrepancies. Their EIS became a major tool for decision making. Rockart and DeLong (1988), in their study of the 30 companies using EIS, have given the example of Philips Petroleum Company which managed to improve their decision making process with the help of EIS. They obtained relevant and accurate information such as economic and political news, as well as internal supply and marketing data critical to their pricing decisions. Another example of improved decision making cited by Rockart and DeLong was of a large retailing company. Faced with major revenue losses, the vice president ordered the development of an EIS to streamline the reporting process from the firm’s stores. The EIS was successful in providing information which enabled timely and detailed analysis of issues and problems and helped in redirecting their business. A similar example is the Conoco study which also emphasised the benefit of improved decision making. There was a strong agreement among the EIS users, that the EIS application had enhanced their ability to analyse market supply and demand conditions. From these they had been able to respond quickly to problems and opportunities. Whymark (1991) in his study of the implementation of EIS for the Australian Navy has found that the system benefited the
admirals in their decision making through the provision of all critical information at their fingertips.

3.4.1.4 Bargaining benefit.
EIS also brings benefit to the process of consensus development. Executives in an electronics corporation cited by Rockart and DeLong (1988) found that they were able to focus on more strategic questions dealing with the performance and future of the company. With the standard information provided by the EIS, there were fewer arguments about validity of the performance and who had the right figures.

3.4.1.5 Commanding benefit
One of the possible results of an EIS may be to expand the range of information which a senior executive can see, improving his visibility of events at the operational level. He can increase his span of control and offer much greater scope for personal intervention. Palier and Laska (1990) have cited an example of an EIS installed in a US retail chain store. The EIS provides executives at headquarters information on the daily sales. Through the EIS the Chairman was able to monitor any exceptional increase or decrease in sales and ordered appropriate action. Meiklejohn and Harvey (1989) have quoted an executive who said that, “an EIS sends a signal to the rest of the organisation about management concern and on the principle that what gets watched gets done, institutionalise this process of control” (p.59)

3.4.1.6 Persuading benefit
Palier and Laska (1990) have given an example of how EIS can benefit executives in their role as persuaders. They have reported the case of the U.S. Army Corps of Engineers headquarters in Washington D.C. The General in-charge made use of EIS to answer congressional questions. With the EIS, he was able to give the answers immediately. The important thing is quick response. It is important that members of Congress feel that an agency is responsive to their needs as Palier and Laska have quoted: “In the final analysis, Congress holds the purse strings, and members sometimes judge an agency as much by how it answers inquiries as by how successful it is at its legislated mission.” (Palier and Laska, 1990,p.11). The benefit here is the good image that
Congress had of the engineering corp. Meiklejohn and Harvey have explained how executives in a UK Health Authority which they surveyed use EIS as a tool of persuasion:

We had a very uncomfortable meeting with the Regional Health Authority because we were overspent at the end of the financial year. But a chart we showed of the amount of Additional Revenue Allocation - the Additional Allocation coming into the district - versus the change in activity, had a striking effect on the other side of the table and, I believe, demonstrated our increasing efficiency. On another occasion a chart we prepared had a considerable impact on local authority representatives at a meeting on joint funding. The discussion it stimulated lasted for some 45 minutes and changed the future plans with regard to the distribution of joint finance. Perhaps for the first time, members of the authority were able to see in readily assimilable form that some of the areas where we had a joint responsibility were not receiving a fair share of resources (Meiklejohn and Harvey, 1989, p.75).

3.4.2 Towards a Model of EIS Benefits

The number of operational EIS is now significant. There are a few studies which have reported distinct benefits, but these benefits are difficult to describe and to measure. They are largely intangible. The association of these benefits with specific theories of executive work provides some insight into the effects of EIS. However, the few studies performed and the small number of operational EIS which they represent do not offer sufficient observations from which to generalise with any confidence. This may explain why there has been no theoretical explanation of how EIS affect organisational performance.

3.4.2.1 Towards a Model of Cost Reduction

The most obvious benefit of any information system is to reduce costs. It is also the easiest to quantify. The cost of any activity is the sum of the cost of the ingredients and the cost of performing the activity. Management is a labour-intensive activity. Hence, major savings would arise in any organisation if fewer managers were required.
The so-called information processing model of organisations (Galbraith, 1977) views a firm as a mechanism for manipulating information in order to overcome uncertainty. In this context first line managers collect raw data on organisational performance. It then falls to middle managers to process this data by summarising, modifying, delaying, and routing it (Huber, 1982). Finally, executives use the information created by their subordinates in order to decide how to respond to problems and opportunities.

Drucker has observed that when an organisation begins to view itself as a means of processing information ... “[a]lmost immediately, it becomes clear that both the number of management levels and the number of managers can be sharply cut. It turns out that whole layers of management neither make decisions nor lead. Instead their main, if not only, function is to serve as ‘relays’ - human boosters for the faint, unfocused signals that pass for communication...” (Drucker, 1989, p.202). The resulting effect of reducing middle level managers in a company is to create a so-called “flattened” hierarchy. This has been one of the prime concerns of the recent trend towards business process reengineering (Davenport, 1993).

Jonscher has argued further that the most significant characteristic of information processing is its extraordinarily high potential for standardisation. Since the task of management is largely information handling, then there must be scope for great economies of scale. He has written:

[One cannot help noticing how standardised are the informational activities carried out by diverse businesses. The number of billing clerks per accountant, of secretaries per administrator, of telephones per officer worker - indeed, practically any measure of the pattern of expenditure on informational activities - appears to be stable across industries.... There are a few different ways in which it [information] can be stored..., a few different ways in which it can be transmitted, and a few different ways in which it can be processed.... By contrast there are countless thousands of entirely different processes carried out on noninformational goods. There is practically nothing in common between the actions of assembling furniture and mining coal. (Jonscher, 1994, p. 16).}
This uniformity across industries suggests that there is a great opportunity to reduce the number of middle level managers, not simply by automating a firm’s reporting of operational performance but also by creating a generic system for collecting and distributing this data which can be employed by organisations in almost any industry.

One illustration of this benefit is Zeneca, an international chemicals manufacturer, which installed an EIS (Work, 1997). This system makes available daily statistics on operations from any of its plants around the world to its Director of Manufacturing in Haselmere, England. He is able to view these figures when he arrives at work each morning. The system highlights any discrepancy between planned and actual figures so that they are immediately obvious. The Director often calls the manager of a plant directly in order to ascertain the nature of any shortfall which he sees in the daily figures. As a result, Zeneca has restructured its manufacturing division and removed two levels of management - the head of manufacturing at country and regional levels.

Figure 3.3 shows a causal map which explains the origins of cost reduction. The map suggests that two features of an EIS are essential to realising this benefit. The first is improved information. This is because an EIS provides information immediately from its source without having been summarised or modified by any intervening managers. The second is an easy-to-use interface. This combination of features provides a new organisational capability which allows executives to accelerate the speed with which they absorb and process information. The mechanism for doing this is the daily performance report which highlighted exceptions. This makes it easy for executives to focus quickly on problem areas. An organisation which adopts exception reporting will only realise its benefits if its behaviour accords with the innovation. The flattening of the hierarchy represents the realisation of this change. Lower operating costs is the outcome and higher performance the ultimate benefit to the organisation.

This causal map offers a very limited view of an EIS as providing to an individual executive up-to-date, detailed, operational data in an electronic form which is easy to understand. This poses two difficulties. The first is that such a system reflects only
Figure 3.3 Causal Map of Cost Reduction
limited capabilities of an EIS given the definition of an executive used in this dissertation. It is essentially a basic executive retrieval system which focuses only on operational performance.

The second difficulty is the impact which such a system might have on an individual executive and his organisation. Miller (1993) has speculated that in organisations which are in decline executives tend to rely on highly formal, focused information systems and conduct relatively less broadly targeted, informal scanning. Gill (1995) has offered two well-known cases studies, Battery March and Mrs. Fields Cookies, both of whose decline was hastened by information systems which made it easier for executives to monitor performance than to scan their environments widely. Organisational theorists refer to this as the “threat-rigidity” hypothesis (Staw et al., 1980) - firms will exhibit a tendency toward well-learned or habitual responses when under environmentally-induced threat.

The implication is that an executive retrieval system which focuses solely on operational performance may encourage an executive to concentrate exclusively on daily issues. Without a complementary means of scanning the external environment for strategic issues, an executive may spend too much time on short-term issues and miss the new opportunities and threats which will affect the long-term future of his organisation. Hence, such a limited system may have a significant impact on an organisation’s personnel costs, but it may also pose a risk to a firm’s ability to adapt.

These suggestions are consistent with academic studies which consistently find that executives rely more on information which arises from external sources than from internal sources (Aguilar 1967, Keegan 1974, El Sawy 1985). Kefalas and Schoderbeck (1973) have reported that executives working in dynamic environments spend more time scanning. Gordon and Narayan (1983) have also argued that perceived environmental uncertainty causes a greater need for information. Daft et al. (1988) have offered evidence that the more turbulent the environment the more broadly an executive scans. A plausible inference of these studies is that the more frequently an executive’s environment is changing, the more he depends on external information.
An organisation may overcome these drawbacks by incorporating external data into an existing executive retrieval system. However, this is not likely to have much impact on measurable costs. There are several reasons for this.

First, Aguilar (1967) has found that 71% of the external information which executives acquire comes from personal contacts outside the firm. Keegan (1974) reports a similar figure (67%). Sproull (1984) has emphasised that this information often comes from conversations. El Sawy (1985) has also found that most strategic information gathered by executives is oral. Deft et al. (1988) have concluded that as environmental uncertainty grows executives draw more on personal than written sources.

Secondly, the information which executives use takes a myriad of forms. Academic studies have consistently made this point (Aguilar 1967, Mintzberg 1973, El Sawy 1985). Mintzberg has suggested that the majority of the information is unsubstantiated rather than factual. It often concerns opinions and preferences rather than data which can be confirmed or disproven. El Sawy describes the information gathered by CEOs to be “mostly gossip and tidbits” (1985,p. 59). Both Aguilar’s and Keegan’s studies support this conjecture. Daft et al. have suggested that this situation may indicate a paucity of hard data.

Incorporating data into an EIS from external sources which is qualitative and unconfirmed and which supplements data gained from conversations is possible. However, it would require much structuring and interpretation to do so. This would almost certainly require skilled systems designers, support technicians, and information analysts to construct. Such efforts are likely to add somewhat to the personnel in the organisation rather than decrease it.

Belcher and Watson (1993) have found that the use of technology can increase the productivity of analysts who prepared external quantitative data for an EIS. However, in the case study which they have described this gain in efficiency did not result in cost savings. Instead it leads to the incorporation of new data to the EIS which had never before been available. One result of Young’s and Watson’s (1995) survey of 128 firms
which use EIS supports this conclusion. They have found significant correlation between
the number of features an EIS contains and both the number of users and the number of
staff. They have proposed that this relationship arises because individual executives want
personalised systems. This leads to an increase in features. The need to create and to
maintain these features means additional support staff.

Hence, the existing evidence implies that improving the quality of information available
to an executive by means of an EIS can lead to a significant cutting of costs because of a
reduction in levels of management. However, it is not likely to result in a decrease in
support staff since here the benefits of increased productivity will usually be reinvested in
improving information quality further.

3.4.2.2 Towards a Model of Responsiveness
The literature on EIS suggests a second means of assessing the effect of EIS on
organisations. As early as 1986 Rockart and Delong had concluded that ‘by far the
largest category of “successful” ESS [i.e. EIS] are those designed to improve the
organisation’s planning and control processes.’ (1986, p. 22) The primary advantage
which this offers is that executives can receive performance data more quickly than
through existing channels. This allows him to identify any variance from planned
performance rapidly and intervene to correct the situation immediately. The increase in
executive control over organisational activities may lead to improved performance, not
necessarily by reduction in intervening managers, but by increased attention to budgetary
compliance.

The Harvard Business School’s case study of the use of EIS at Phillips Petroleum to
monitor crude oil trading is probably the best known example of this benefit (Applegate
and Osborn, 1988). As Robert Wallace of Phillips has explained:

“We made $50 million last year on crude oil trading. We made that driving
things very much from the executive level. We had managers and traders
and all the background people, but the real dollars were made because senior
management was staying on top of all the events we could perceive on a
daily basis that were moving us towards some opportunities. And we were able, through our increased understanding, to quickly make a decision to act.” (Delong and Rockart, 1988, p. 258)

This acceleration was the result of using an EIS. The benefit is not primarily a reduction in levels of management, but an increase in responsiveness to departures from a plan.

The use of an EIS to respond quickly to deviations in organisational performance has the same drawbacks as the use of an EIS to reduce levels of bureaucracy. It may well cause executives to take over the responsibility of lower level managers. As a result, they may spend less time and attention on the strategic issues which are critical for the future of the organisation.

Incorporating information on a firm’s environment into an EIS may well improve its responsiveness to opportunities or threats. In their survey of chief executives of 156 Texas hospitals Thomas et al. (1993) have suggested that increased scanning of external data actually leads executives to view strategic issues as opportunities rather than as problems and gives them a feeling of control over their destinies. The authors have identified a correlation between executives’ feeling of control and the number of products and services offered by their hospital. They have construed that this results in higher asset utilisation, greater profit margins, and a growth in the number of patients treated.

This finding is consistent with the investigation of Shortell et al. (1990) which demonstrated that successful American hospital managers stressed the need to differentiate their hospital’s offerings to customers. Zajac and Shortell (1989) have reached a similar conclusion in a third study of the American hospital industry. Likewise, Smith et al. (1991) have found that a high level of responsiveness to customer demands is correlated to profitability in the domestic American airline industry.

The traditional economic explanation for this phenomenon is that more precise market segmentation leads to the development of distinctive competencies by firms. These capabilities create comparative advantages which may be sustained over a long period
and which lead to higher profitability (Kay, 1993). Of course, in a non-profit organisation a more exact determination of what various members desire may lead to increased loyalty.

The implication of the study is that an increase in products and services is a response to the needs of patients. Rather than conceiving their hospitals as a producer of a few standard services, hospital executives who feel in control of their situation create new services tailored to a specific segment or niche in their market. This move towards mass customisation (Pine, 1993) represents an increased responsiveness towards patients' requirements. It also results in improved performance by means both of improved asset utilisation and increased market share.

Bourgeois's and Eisenhardt's study of six microcomputer firms (1988) has had similar results. They have found that in high velocity environments, such as microcomputing, that firms which make decisions quickly have higher performance in both qualitative and quantitative terms. Further they have suggested that this is not simply because responsiveness leads to the satisfaction of customer demands as Thomas et al. have concluded. They have proposed that effective firms try new things. This implies that responsiveness allows firms to undertake marketing experiments. Responsiveness is not seen to necessarily lead directly to products or services which meet customer needs more precisely. It quickens the trial and error process of learning what customers want. Peters and Waterman (1982) have referred to this approach by the phrase "ready, fire, aim". Bhide (1985) has labelled it "hustle".

The key mechanism which Bourgeois and Eisenhardt have discovered for creating responsiveness is the implementation trigger. They have found that effective executives make decisive choice and at the same time identify decisions to be triggered by a schedule, milestone, or event. These triggers allow firms to keep their options open for as long as possible. If they are clearly articulated, they can also be delegated to individual executives. This means that implementation will not divert the executive team unnecessarily. Bourgeois and Eisenhardt have argued that the risk of innovation can be
controlled in this manner. Their findings indicate that there is a direct relation between the degree of delegation of implementation and organisational performance.

Eisenhardt’s study of the management teams in eight microcomputer firms (1989a) reinforces these findings. She finds a strong correlation between the speed with which problems and opportunities are identified and resolved and organisational performance as measured both in qualitative and quantitative terms. However, she has noted that her research was restricted to a turbulent or “high velocity” industry. She has offered two possible explanations. The first is that in fast moving environments opportunities come and go quickly. Once a firm is behind, it is difficult to catch up. The second is that executives learn by making decisions, but if they make few decisions they learn slowly. This suggests that while an accelerated capacity for cognitive processing may increase the number of staff involved in support and interpretation, it may reduce the time which executives spend making and implementing decisions. This improves the productivity of executives and so, leads to a form of organisational slack. Executives may employ this extra time to create a virtuous circle of learning by scanning more and by identifying even more opportunities and threats.

Eisenhardt has found three key mediating processes which contribute to responsiveness. The first two are confidence to act and accelerated cognitive processing. These are features identified by Thomas et al. as well. The third is smooth group processes. She has found a correlation between the currency of an executive’s data and accelerated cognitive processing. She has also identified a correlation between smooth group processes and the currency of data. She has explained this by arguing that real-time data increases responsiveness. This leads to more experience of decision making which improves the effectiveness of senior management teams.

In an earlier paper Eisenhardt and Bourgeois (1988) have examined the politics of strategic decision making in the microcomputing industry. In this study they have used Pettigrew’s (1973) definition of politics as:
...the observable, but often covert, actions by which executives enhance their power to influence a decision. These actions include behind-the-scenes coalition formation, off-line lobbying and co-optation attempts, withholding information and controlling agendas. Politics contrast with straightforward influence tactics of open and forthright discussion, with full sharing of information, in settings open to all decision makers. (Eisenhardt and Bourgeois, 1988, p. 738)

Within this context they have concluded that the greater the use of politics within the top management team, the poorer the performance of a firm, once again measured both quantitatively and qualitatively. They have argued that the chief means by which politics may affect performance is by increasing the time to make the decision and by restricting information which creates communications barriers and inflexibility within the team. In short politics disrupts the group process, while openness smooths it. They have observed that turbulent environments exacerbate this effect.

These findings suggest the causal map which explains the origins of responsiveness shown in Figure 3.4. The map suggests that four features of an EIS are essential to realising this benefit. They are an easy-to-use interface, improved information, an integrated database and communications. An EIS provides up-to-date information by means of an easy-to-use interface. This results in an accelerated cognitive processing capability. If executives use this capability to examine a wider range of variables, then their confidence to act will increase. Incorporating the improved information into an integrated database will make the data available to all. If used properly, this feature will lead to lower conflict in the organisation and will make delegation of authority more feasible. The ability to communicate electronically may also encourage delegation. The capability to delegate authority and to increase the processing of information allows executives to define implementation triggers effectively. This may lead to two types of organisational behaviour - increased confidence to act and to smoother group processes. The articulation and delegation of implementation decisions to an individual executive leads to more efficient use of other executives’ time and can hasten learning. Openness arises from the capability to reduce conflict. This manifests itself in smoother group processes. However, openness also increases a group’s confidence to act because it may
Figure 3.4 Causal Map of Responsiveness
lead towards consensual decision making. As several of the studies mentioned have demonstrated both confidence to act and smooth group processes result in responsiveness.

3.4.2.3 Towards a Model of Depth of Understanding

Organisational performance was central to the thinking of the so-called classical management theorists, such as Fayol (1949) and Gulick (1937). They have argued that the rational-analytic approach to management is the one certain means of assuring high performance because it results in acquiring a depth of understanding of an issue before making a decision. This should lead to more effective decisions. A number of influential, contemporary academics such as Porter (1980) have advocated this view as well.

The term “rational-analytic” usually refers to the belief that problem solving should take place in the context of a consciously formulated strategy. This context results from strategic planning and consists of the identification of goals and the setting of priorities. The resulting strategic plan defines the meaning of good performance for an organisation. Executives also frame problems and opportunities with reference to this plan. Problem solving or the seizing of an opportunity requires the collection of information, the generation of alternatives, and the careful evaluation of ends to means. In short optimum performance arises from choosing the best solution to every problem or the best response to every opportunity. This can only happen when executives deeply understand what they are trying to do and select the most suitable alternative from the full variety available.

Fredrickson and Mitchell have isolated a key element of the rational-analytic view which they refer to as “comprehensiveness”. They define comprehensiveness as “the extent to which an organisation attempts to be exhaustive or inclusive in making and integrating strategic decisions.” (1984, p. 402). Fredrickson (1984) has suggested that rational analysis depends on two forms of comprehensiveness. The first is analytical comprehensiveness which refers to the development of a number of alternative solutions and the collection of information regarding those solutions. The second is integrative comprehensiveness which refers to the degree to which an individual decision is
considered in the light of other strategic decisions. Proponents of the rational-analytic approach have argued that analytical comprehensiveness leads to more insightful action and that integrative comprehensiveness improves consistency of action.

Fredrickson (1984) examined 38 U.S. firms from the painting and coatings industry. He interviewed 152 executives in these firms and on this basis constructed a decision scenario. Each participant had to read the scenario and then complete a questionnaire concerning how his firm would respond to this situation. Fredrickson quantified each company's response in order to produce a measure of comprehensiveness of its strategic decision processes. He then compared this metric against average after-tax return on assets during the previous five years and the percentage change in gross sales during the same period. He found that there was a strong positive correlation between the comprehensiveness of an organisation's decision making process and its performance. Bourgeois's and Eisenhardt's (1988) study also has found evidence that the more analytically comprehensive a firm's strategic decision making, the better its performance.

Eisenhardt (1989a) has particularly associated analytical comprehensiveness with the creation and simultaneous consideration of a number of alternative responses to each opportunity or threat. The ability to do this, of course, depends on an organisation being able to process information rapidly. The exhaustive examination of multiple solutions Eisenhardt has concluded also contributes to a confidence to act. In the same study Eisenhardt (1989a) has also found a connection between the integration of decisions (i.e. integrative comprehensiveness) and both accelerated cognitive decision making and confidence to act.

These findings suggest the causal map which explains the origins of comprehensiveness shown in Figure 3.5. Here an easy-to-use interface to improved information and modelling and simulation features creates an accelerated cognitive processing capability in an organisation. This is what most authors refer to as an Executive Support System. Executives may use this capability to increase analytic comprehensiveness by examining multiple alternatives simultaneously as well as by considering a wider range of variables. It also allows better integrative comprehensiveness by improving the mechanisms for
Figure 3.5 Causal Map of Depth of Understanding
integrating decisions. These various mechanisms may lead towards more comprehensiveness in an organisation’s strategic decision making. The result is a deeper understanding of the problem and its consequences. This is what is meant by the rather vague phrase “improved decision making”.

The benefits of a deep understanding of a problem and its proposed solution are twofold. First, it may lead to higher performance because a firm whose executives understand problems and opportunities better than their competitors’ directors may have to experiment less. They may get it more nearly right first time. Also, as Neustadt (1960) has shown an executive’s power to persuade rests not simply on his position, but on his ability to show a command of his subject. Depth of understanding is one of the key components of a President’s reputation which Neustadt has identified.

3.4.2.4 The Relationship Between Responsiveness and Comprehensiveness

Eisenhardt has claimed that her work demonstrates that the greater the number of alternatives considered by microprocessor manufacturers, the faster the speed of their strategic decisions. The same relationship seems to hold between the integration and speed of decisions. Her conclusion then is that there is a link between comprehensiveness (both analytic and integrative) and responsiveness.

However, this conclusion is problematical. Dess (1980) has classified the U.S. painting and coatings industry as the most stable of fifty-two randomly selected industries on the basis of sales growth and technological change. Hence, the context of Fredrickson’s study (1984) was extremely stable. Bourgeois’ and Eisenhardt’s (1988) and Eisenhardt’s (1989a) studies were of the U.S. microcomputer industry for which they coined the term “high-velocity environment”.

In the companion-piece to Fredrickson’s paper Fredrickson and Mitchell (1984) have used the same survey instrument to evaluate the comprehensiveness of 109 executives in 27 firms in the U.S. forest products industry. They chose this industry because Dess (1980) had identified it as the third most unstable industry of 52 randomly selected. In their study Fredrickson and Mitchell have found that there was a consistently negative
This result is in keeping with contingency theory. This theory postulates that successful organisations adopt strategies and structures which are appropriate to the degree of turbulence in their environment. Well structured hierarchies which pursue cost reduction perform well in stable climates. In these circumstances comprehensiveness leads to better performance. Organic ad-hocracies which continually change their products and services to meet fluctuating customer demands perform well in rapidly changing markets. In these circumstances responsiveness results in high performance. In other words good performance depends on adopting a management style which is appropriate to the degree of stability in an organisation's environment.

Lawrence and Lorsch (1967) have coined the term “contingency theory”. They have formulated their proposition on the study of a handful of American companies in several industries undergoing varying rates of change. Burns' and Stalker's (1961) investigations of the English and Scottish electronics industry defined the term organic organisation and concluded that such firms were more likely to succeed in changing environments, while mechanistic firms were more successful in stable environments. In short the evidence for contingency theory is substantial and has been collected over a long period.

Uncertainty is the key concept in the explanation of contingency theory. Galbraith (1973) has defined uncertainty to be the difference between the information needed to perform a task and the information available. It, therefore, differs from risk which results from probabilistic information. Spender (1980) has identified four major types of uncertainty. Incompleteness refers to a lack of existing information. Obviously, the solution to incompleteness is to search for further information. Indeterminacy refers to the unpredictability of others. This involves an appreciation of how others may respond to decisions. Clearly, an understanding of another's motives and personality is helpful in anticipating their reactions, but the only way to be certain is to act and observe the consequences. Irrelevance refers to context. This requires an executive to be able to
characterise an existing situation as a reoccurrence of a previous situation. Incommensurability refers to the lack of appropriate frameworks with which to evaluate the available information. As Spender has observed “[w]hen the problem is incompletely specified, the manager’s choice is a true act of judgement.” (1980, p. 45)

Thompson (1967) has proposed that organisations attempt to act rationally. Therefore, in stable environments executives gather information on critical variables on a regular basis. Constant monitoring of these data allows executives to develop their understanding of the causal relationships which determine success in their industry. When problems or opportunities arise, executives may propose alternative means of resolution. They may evaluate each solution thoroughly and seek additional information to support or refute their analysis. They may also weigh these potential means in the light of previous strategic action. Because their industry is stable, there is no urgency to come to a conclusion. In these circumstances comprehensiveness is a virtue.

However, this scenario is hypothetical because the information needed to act rationally is never available. Uncertainty is commonplace. Comprehensive behaviour assumes that the necessary information may always be founded instantaneously without cost (Williamson, 1975). Moreover, as Simon and March (1958) have observed there are limits to human cognition. Organisational theorists have noted the tendency to simplify at the firm level (Cyert and March, 1963; Braybrooke and Lindblom, 1970). Psychologists have witnessed this same inclination among individuals in numerous experiments (for example, Bruner, Goodenough, and Austin, 1956). Therefore, even if an executive had much of the information which he needed to solve a problem, his rationality would still be bounded.

Obviously, instability in the environment of an organisation is the prime source of uncertainty. The more it is in flux, the less feasible a comprehensive approach will be either in terms of an executive’s mental capabilities, time, or money. Hence, in turbulent environments executives may prefer to take short-term actions rapidly, rather than making decisions which have long-term consequences. They can closely monitor these actions. If an outcome is promising, executives can pursue this course more forcefully.
If it fails, they can withdraw and adopt a new tactic. This is a means of buying a limited amount of information quickly and cheaply. It can, therefore, be seen as a method of coping with uncertainty which allows executives to retreat from any action which does not work without serious penalty. Researchers have named this style of management variously, “muddling” (Lindblom, 1959), “incrementalism” (Quinn, 1978), “hustle” (Bhide, 1985), and “a bias for action” (Peters and Waterman, 1982).

More information leads to less uncertainty. However, because of the cost of acquiring information and of cognitive limitations, the concept of complete information is unthinkable for all but stable environments. This means that a comprehensive analysis is rarely realistic in unstable environments. In these cases executive judgement has to supplement the available information in order to determine what action to take (Spender, 1980).

In the context of theoretical explanations of contingency theory as well as empirical studies of organisational performance which confirm this view, Bourgeois’s and Eisenhardt’s work presents an anomaly. There are several possible explanations.

The most obvious is that their findings are incorrect. In fact Bourgeois and Eisenhardt have used an embedded case study approach (Yin, 1984) as a means of constructing a rudimentary model of strategic decision making in high velocity environments. This method uses a series of case studies, each of which is considered to be an experiment to confirm or deny the inferences drawn from the previous case studies. The result is a generalisation of the empirical data gathered in the case studies. Bourgeois and Eisenhardt have examined four, eight, and eight American microcomputer manufacturers respectively in their three studies. It is not clear whether any one firm is represented in more than one study. The embedded case study approach requires that the researcher continues performing case studies as long as each new one adds significantly to the understanding of the situation. When one identifies a pattern which is repeated in each case, this pattern represents a substantive empirical generalisation. Four or eight firms may be sufficient to establish a pattern within a sector of an industry. However, a number of investigations exist which show that strategic groups within an industry are likely to
develop shared cognitive maps (for example, Porac, Thomas, and Baden-Fuller, 1989). This suggests that while one might expect to find some agreement on the determinants of success for a Silicon Valley microcomputer manufacturer, these patterns may not hold outside of that strategic group. Therefore, generalisation of Bourgeois’ and Eisenhardt’s findings beyond their strategic group are problematic.

Secondly, the problem of determining whether a company’s performance is high or low is a well-known problem. Bourgeois and Eisenhardt have used some subjective measures of performance such as the CEO’s self-appraisal of company’s effectiveness as well as some quantifiable measures such as sales growth and profitability. This raises a number of difficulties, probably the most taxing is correlating historical data with decisions which determine future performance. However, the problem of measuring organisational performance is common to all research findings.

Bourgeois and Eisenhardt themselves have offered two explanations for the discrepancy between their results and those of Fredrickson and Mitchell (1984). They have claimed that the differences may arise from the selection of methods or from the difference in environmental dynamism. This is particularly unconvincing since there are a variety of other studies which disagree with their findings besides that of Fredrickson and Mitchell. Secondly, they have stated that in their investigations they too saw examples of businesses which routinely used satisficing rather than more comprehensive techniques. However, they judged all of these firms to have poor performance. Their implication seems to be that many studies have used firms which are unsuccessful. Thus, these studies have drawn the wrong conclusions. This, of course, is not true of the work of Fredrickson and Mitchell which drew on 27 firms in their study of unstable environments (1984) and 38 firms in Fredrickson’s study of stable environments (1984).

There is another possible explanation of the apparent inconsistency of Bourgeois’ and Eisenhardt’s results with those of previous researchers. In their papers they have made clear what they see as the chief features of successful decision making in high velocity environments. They have portrayed them as:
i. articulating institutional goals explicitly;
ii. employing much real-time information in decision making;
iii. searching for alternative solutions comprehensively;
iv. an absence of political behaviour (i.e. openness);
v. articulating implementation triggers during the decision process;
vi. delegating decisions concerning implementation triggers to the management team;
vii. making decisions quickly;
viii. trying new ideas in the marketplace constantly. (1988)

The real paradox is not between the findings of Bourgeois and Eisenhardt and of others. It is within this list itself. The first four items seem typical of rationalistic and particularly comprehensive approaches. The second four items describe aspects of adaptive or incremental approaches. The implication seems to be that the dichotomy between comprehensiveness and speed is false. Successful organisations reflect thoroughly and act rapidly. Bourgeois and Eisenhardt themselves have pointed out this apparent contradictions within their model:

[the overall lessons are a series of paradoxes: Plan carefully and analytically, but move quickly and boldly. CEOs should be decisive, but also delegate. Choose and articulate an overall strategy quickly, but put it in place only as it becomes necessary. (1988, p. 833)]

An understanding of these apparent paradoxes lies in the notion of uncertainty. Fast, appropriate action is the key to success. It may be possible to imagine having the information at hand needed to define a problem sufficiently, to identify all possible alternative solutions, and to evaluate each comprehensively before making a choice. In reality this is rarely the case. In most situations an executive will have some relevant facts, but will also find that some vital information is inaccurate, unavailable or obsolete. Acquiring and evaluating the necessary information will take time and money. He must decide whether to delay action in order to increase the depth of analysis or to depend on his intuitions and act quickly. In either case an executive must use his judgement since
uncertainty is involved. A search may result in more complete and relevant information, but only action will solve the problem of indeterminacy and incommensurability. Therefore, the most pragmatic course is to experiment. This means devising a good solution quickly and acting on it at once. If it fails, the experiment has supplied more complete and relevant information. It may provide better insight into the interest of others. It may demonstrate the inappropriateness of a set of ideas to the situation. Even failure then should lead to an improved solution which can serve as the basis for another experiment.

Hence, the textbook notion that comprehensive behaviour is a cerebral undertaking which depends on the setting of goals and priorities and the selecting of the best alternative from a range of options is inadequate. Likewise, a bias for action without an accompanying evaluation of its effects cannot possibly lead to better performance without an extended period of luck. Action when viewed as means of experimentation increases comprehensiveness. Quinn has chastised those who encourage this false dichotomy between comprehensiveness and incrementalist styles of management. He has written:

"Logical incrementalism ... is conscious, purposeful, proactive, good management.... It helps the executive achieve cohesion and identity with new directions. It allows him to deal with power relationships and individual behavioural needs, and permits him to use the best possible informational and analytical inputs in choosing his major course of action...." (Quinn, 1978, p. 19).

Rather than presenting an anomaly, Bourgeois and Eisenhardt may have offered a more detailed understanding of the relationship between management style and organisational performance than earlier research.

It is, therefore, possible to argue that the three major outcomes of successful EIS are not mutually inclusive, but additive. Figure 3.6 contains a diagram of the proposed comprehensive causal map of EIS benefits. The map consists of a variety of variables and an approximate indication of the causality by which they are related.
Figure 3.6 Causal Map of EIS Benefits
This causal map illuminates the problem of the realisation of EIS benefits in, at least, two ways. First, it shows that the relationship between the technological features and the benefits of EIS is not straightforward. It is long and complex and depends on a variety of organisational factors. Secondly, it demonstrates that much of the confusion regarding EIS benefits arises from the number of different viewpoints represented in this diagram. For example, the developer of an EIS might well say that the benefits of an EIS are its simple interface and its improved information. This causal map shows that he is mistaking technologies for benefits. On the other hand, many managers refer to improved comprehensiveness or flatter hierarchies as benefits of EIS. Again, the diagram indicates that they are not. In short much of the EIS literature seems to mix means and ends.

3.4.2.5 Interpretations of the EIS Benefit Model in the Context of Theories of Executive Work

The composite benefit model presented above does not refer to any particular theory of executive work. In fact it can be interpreted in the context of any of the six models discussed earlier in this chapter.

3.4.2.5.1 Learning

One view of an EIS is that it supports executive learning. An EIS can do this by accelerating the pace at which an executive learns. The composite causal map of EIS benefits in Figure 3.6 suggests that there are three ways in which this may occur. The first arises from the improved quality of information made available by the EIS. The second arises from incremental decision making. The third arises from the accelerated repetition of cycle after cycle of problem solving.

First, an EIS which allows an executive to scan hastens learning because it provides more timely and relevant data more quickly. Improved information enables an executive to examine a greater quantity of data. This means he may consider more types of data; he may select them from a wider range of sources; and he may use data which is more detailed. The use of more information means an executive’s preconceptions (i.e. his
cognitive models) may be challenged more often, leading to their frequent refinement. This is Piaget's definition of learning.

Secondly, processing more information will also mean an executive may identify more problems and opportunities quicker than competitors who do not have a similar capability. An EIS which allows an executive to perform focused searching may hasten the decision on how to deal with problems or opportunities. There are several reasons for this. El Sawy (1984) has outlined how the ability to retrieve specific information is critical in the precise formulation of problems and opportunities. The information found by means of focused search may also expedite the evaluation of potential solutions. Finally, an incremental approach to implementing decisions requires the articulation of triggers. These triggers imply further decisions which will be made at a later date when additional information is available. Focused search should be the mechanism for gathering this information. Every decision whether it concerns a major problem or whether it is associated with an implementation trigger provides a chance to learn. A quick decision offers the potential for accelerated learning.

Thirdly, if an executive consistently increases the pace at which he resolves problems and opportunities, he may deal with more over the course of time. Not only may an executive who adopts EIS go through each decision cycle faster, he will have the ability to solve more problems. Hence, he may create a virtuous circle or a positive feedback loop. The more an executive uses an EIS to learn, the more problems he solves and the more opportunities he seizes.

Hence, an EIS may improve an executive's ability to learn about an individual strategic issue in the short term, but it may also improve an executive's ability to learn in the long term. Learning increases an executive's depth of understanding and arises from the same features of the EIS benefits model which lead to responsiveness - accelerated cognitive processing, the inspection of a wider range of variable, and analytic comprehensiveness. Learning, therefore, results in improved organisational performance and in the enhancement of an executive's reputation. Figure 3.7 shows the portion of the EIS benefits model which corresponds to learning.
Figure 3.7 Causal Map of Effects of EIS on Learning
3.4.2.5.2 Sensemaking

Another view of an EIS is that it assists sensemaking within a community of executives. One might categorise sensemaking as one theory of group learning. This suggests that an EIS can support learning for groups of executives as well as individuals. It can do this by accelerating the pace at which a group of executives learn. Moreover, it can increase the scope and quality of participation within the group.

In their article “Sensemaking and Group Support Systems” Weick and Meader (1993) have suggested that there are five sensemaking activities which automation might affect:

i. Action - sensemaking depends on the interpretation of previous actions
ii. Triangulation - sensemaking improves with an increase in measures
iii. Affiliation - sensemaking improves with an increase in participation
iv. Deliberation - sensemaking improves if the first interpretations is not accepted
v. Contextualization - sensemaking requires placing events into a shared context

An EIS may have an impact on each of these five activities.

Once again, the composite causal map of EIS benefits in Figure 3.6 suggests that there are three ways in which learning may be improved. The first arises from the improved quality of information made available by the EIS. Being able to extract information from a wider variety of sources quickly should increase a group’s ability to triangulate an interpretation. The second arises from incremental decision making. The ability to identify a problem or opportunity and then use the implementation process as a mechanism for learning more about it exemplifies the activity which Weick and Meader refer to as “action”. The third arises from the accelerated repetition of cycle after cycle of problem solving. Because an EIS can accelerate sensemaking, it will allow a group to make more decisions than a similar group which has not been aided by computers. This means that they will come to develop a shared view of situations faster. This will aid them in the task of contextualization - the attempt to agree on an event’s relation to previous events.
However, in sensemaking an EIS need not just increase the speed of learning, it may also have an effect on participation. This occurs in two ways. First, the asynchronous and global characteristics of an ECS allow the scope of the group to be expanded. This means that each member of the executive group need not be present in the same room at the same time. This ability to expand the participants allows a greater diversity in expertise and in experience which assists in triangulation. In such a group learning may be more comprehensive. Weick and Meader (1993) have also suggested that computer support can overcome some of the causes of dysfunction in a group such as polarisation, conformity, and lack of free exchange of ideas. Nunamaker et al. (1991) and Gallup et al. (1988) have particularly instanced anonymity in communications as important in this respect. In addition delegation of responsibility for implementation gives individual executives an important incentive to participate in decisions which will affect them, especially when the results will be immediately visible to their colleagues. These features lead to a more open discussion of matters.

Of course, more learning increases the depth of understanding of every executive in a group. In the context of sensemaking this happens because of both accelerated cognitive processing and also of wider and more active participation in the group process. In addition Weick and Meader (1993) have speculated that the asynchronous nature of computer supported sensemaking may also offer better opportunities for deliberation. This is because executives are able to reason about anomalies more carefully over a longer period of time. All of these effects are consistent with the causal map for learning, but also include the additional features arising from improved participation. Figure 3.8 shows the portion of the EIS benefits model which corresponds to sensemaking.

### 3.4.2.5.3 Satisficing

Possibly, the most widely discussed view of EIS is as a tool for decision support. An EIS can do this by increasing the analytic and integrative comprehensiveness of the decision making process. Hence, an executive need not satisfy, that is he does not have to rely on the first suitable response to a problem or opportunity which he identifies. Instead he can select a number of options to evaluate before choosing the one which best satisfies
Figure 3.8 Causal Map of Effects of EIS on Sensemaking
the constraints arising from previous decisions which he and others have made. The composite causal map of EIS benefits in Figure 3.6 suggests that there are three mechanisms that encourage this behaviour. The first arises from the improved quality of information made available by the EIS. The second arises from the ability to evaluate alternatives by means of simulation. The third arises from incremental decision making.

An EIS should provide information which is more timely, more detailed and from a wider variety of sources. It also has facilities which simplify and speed focused searches. These features allow an executive to use more data while considering a problem or an opportunity without any increase in time or cost. This makes it possible for him to consider more alternatives, more analytically, before deciding.

The central feature of an ESS is a capability to simulate a situation in order to evaluate the outcomes of different scenarios. This allows an executive to scrutinise the possibilities systematically. Moreover, the improved information offered by an EIS may provide both input data to a model and confirmation of the output of a model.

The ability to track decision implementation offers another way to gather information without actually slowing the speed of the process. All uncertainty can not be overcome by improved means of search. Indeterminacy, for example, can only be resolved by action. Therefore, the creation of decision triggers mark out a plan for acquiring necessary information. Of course, decision triggers do not assist only in increasing the analytical quality of a decision. If all of an organisation's decisions are made in this manner, executives may assess the impact of decisions previously adopted on the one under current consideration. This leads to more integrative decisions as well.

In these ways an EIS can increase the comprehensiveness of an executive's decisions. Hence, he may move away from satisficing as a strategy without any slowing of the time required to make a decision. This means that his depth of understanding will increase without any effect on his responsiveness to problems and opportunities. This can lead to an enhanced reputation for the executive.
3.4.2.5.4 Bargaining

An alternative view of EIS is that it can assist executives in bargaining. It does this in three ways. First, it opens the process of making strategic decisions. Secondly, it ensures that an organisation takes a comprehensive approach to innovation. Thirdly, it improves the organisation's ability to make decisions by means of bargaining which can result in a long-term competitive advantage.

The political theory of executive work assumes that conflict is the norm in any organisation because its members are never in complete agreement. This lead to coalitions of members with partially shared interest. One of these coalitions must be able to address the most serious problem if the organisation is to survive. This coalition consists of its executives. According to this theory, innovative departures are to be discouraged because they might lead to the break up of the dominant coalition. Therefore, the chief activity of executives is to avoid having to make strategic decisions.

In other words, the political theory of executive work extends the concept of choosing from the individual to the group. It does this by proposing a number of organisational mechanisms for choosing:

i. Adopting good business practice
ii. Using goals as independent constraints
iii. Solving problems as they arise
iv. Distributing pieces of problems to different parts of the organisation
v. Simplifying problem search

When these methods are employed, it becomes unnecessary for executives to make many strategic decisions. Under these circumstances, an EIS, according to the definition used in this dissertation, has little use and few benefits.
Figure 3.9 Causal Map of Effects of EIS on Satisficing
Pettigrew's (1973) examination of the political aspects of strategic decisions is more informative, however. He has suggested that executives often have to seek expert advise before responding to a significant new problem or opportunity. Pettigrew has concluded that who influences them depends on who they ask and on his perceived status.

If a group of executives wishes to make the best possible decision in these circumstances, they need to consult widely and weigh the responses. Increasing participation should increase the analytical comprehensiveness of a strategic decision because more views are likely to lead to a wider variety of alternatives. Increasing participation should also increase the integrative comprehensive of a decision because the more people who are involved, the more likely the impact of previous decisions will be taken into consideration. Of course, the use of a wider range of sources of information also has the same effect. An accelerated cognitive processing ability makes this possible. In addition allowing the entire deliberation to be visible to all participants leads to a smoother group process even though more are involved. The use of simulation provides a means to evaluate various alternatives. This contrasts with the reputation of the proposer as a basis for selection. All of these factors can create increased confidence in the decision which was made.

Hence, an EIS may improve an organisation's ability to bargain effectively about strategic issues. This may mean that the organisation can reach a consensus more quickly. This results in improve responsiveness and allows time to make more decisions by open negotiation. This leads to a virtuous cycle which offers the potential for a long term competitive advantage.

Figure 3.10 shows the causal map of the effects of EIS on bargaining.

3.4.2.5.5 Commanding

Using an EIS to assist an executive in executing commands is probably the simplest way in which it can be employed. An EIS can help an executive monitor the implementation of his commands. Monitoring the progress of commands depends largely on providing an executive with more detailed and more immediate information about the
Figure 3.10 Causal Map of Effects of EIS on Bargaining
implementation of the action which he sanctioned. Exception reporting is the main vehicle for this. This, of course, can lead to a flatten hierarchy which puts an executive in closer touch with those who do his bidding. The result can be lower costs and more responsiveness.

Figure 3.11 shows the casual map of the effects of EIS on commanding.

3.4.2.5.6 Persuading

An EIS can assist an executive’s rhetorical ability. It does this by affecting each of the three aspects of argument: an executive’s reputation; the logic of his argument; and his appreciation of his audience.

Neustadt (1960) has concluded that reputation and public prestige form the foundation of a President’s ability to persuade. Each President has approximately identical authority and status, but not all are equally persuasive. One reason for this is a President’s personality which may add or detract from his persuasiveness. Another is his skill and expertise. However, Neustadt has argued that it is the view of his various constituencies regarding his will to act which is at the heart of his reputation. His evidence suggests that it is the consistency of a President’s words and deeds as well as their timing and means of delivery which are critical in forming his public prestige. A President’s success then depends on his ability to understand his audience and for this he needs as much information as possible from as many sources as possible.

Enhanced reputation is one of the primary benefits of an EIS. It arises from a depth of understanding which is spawned from a comprehensive approach to decision making. In the case of persuasion Neustadt has claimed a special importance for integrated comprehensiveness. However, there is no obvious reason why analytical comprehensiveness might not also enhance an executive’s prestige. These both arise from the use of a wider range of variables, considering multiple alternatives simultaneously and decision integration. Moreover, these same characteristics can increase an executive’s confidence to act. This decisiveness may have a lasting impact on an executive’s public esteem when he is seen as being responsive to a specific concern.
Figure 3.11 Causal Map of Effects of EIS on Commanding
On the other hand, an EIS can also help those who must be persuaded. Neustadt (1960) has argued that an executive’s orders are tantamount to action only when five conditions are met:

1. There is assurance that the executive has spoken;
2. The meaning of the order is clear;
3. The orders are public;
4. The person who receives the order has the means to carry it out;
5. The general belief that the executive’s order does not exceed his authority. (p.19)

Electronic communications offer little help to a person who must determine whether he has the means to carry out an instruction or whether the instruction exceeds the executive’s authority. It may even make authenticating the order more difficult. However, an EIS probably does have an impact on the third - public pronouncement. Broadcasting a command makes it visible to a community and doing it by means of an electronic media allows it to be stored and referenced at a later date. The storage of an executive’s previous instructions, memoranda, speeches, etc. may also help to demonstrate a consistent pattern in an executive’s pronouncements and assist a person in interpreting the instruction. This can result in a more integrative comprehensiveness in executing orders. It also increases the openness of the process.

In addition an EIS provides another source for helping an executive understand his various constituencies. Neustadt has cautioned that it is gossip, opinion, and other types of informal information which are often the best. However, an EIS which contains more detailed and more current information from a myriad of sources inside and outside of an organisation is surely more suited to this purpose than other formal organisation information systems. This discussion offers a new interpretation of the term “depth of understanding”. Neustadt does not speak of understanding in terms of specific decisions, but rather in terms of the desires of an executive’s constituents and the timing of his interventions.
Reputation is self-enforcing. An enhanced reputation is not simply the result of an act of persuasion, it is the raw material of a subsequent act as well. Therefore, an EIS may help to establish a positive feedback loop which continues to improve the reputation of an executive over time.

Figure 3.12 shows the causal map of the effects of EIS on persuading.

3.5 Why are EIS Benefits not Realised?

The previous section identified two potential benefits of EIS - higher performance for the organisation and enhanced reputation of its executives. Figure 3.6 proposes a chain of causes and effects which has to occur within an organisation if these benefits are to be realised. A survey of EIS literature suggests that few have successfully employed EIS in order to achieve the potential benefits. In fact this dissertation has argued earlier that realising the benefits of EIS is particularly difficult. Why then should any EIS project fail?

There are two means available for answering this question immediately. First, there is an extensive literature regarding the reasons for the failure of information systems projects over the past three decades. These studies produce consistent results even though they cover such a lengthy time span. There is no reason to assume that EIS should differ fundamentally from other information systems in this respect. Secondly, several authors in recent years have considered the critical success factors for EIS. Together these sources provide much insight into the potential pitfalls in realising the benefits of EIS.

3.5.1 Classifying the reasons for IS Failure

In general the literature on IS failure identifies three factors - individual characteristics of users, organisational characteristics, and technical features of the system. Systems fail when:

i. the users do not have characteristics that will enable them to reap the benefits.

ii. the organisation does not have characteristics which are necessary to achieve the benefits;
Figure 3.12 Causal Map of the Effects of EIS on Persuading
Markus (1983) has proposed three categories of factors to explain resistance to MIS implementation efforts. First, people resist MIS for personal reasons. Second, they resist because of interaction between specific system design features with some aspects of organisational context. Third, they resist because of poor system features and design. Markus has suggested that when human nature, cognitive styles, or personality traits are incompatible with the requirements of a computerised information system, the system’s intended users will resist its utilisation. Organisationally, she has observed that when the introduction of a system is perceived as changing the balance of power among the participants, then those who will lose power will resist. She has identified poor design and implementation as features which contribute to resistance towards a system. It is these three groups of factors which determine whether a system’s benefits will be realised.

Kraemer et al. (1993) have put forward these same three categories of factors as affecting the perceived usefulness of a computer-based information. They have found that direct experience of using computer is important for an individual’s acceptance of a new system. They have observed that organisational professionalism and the types of tasks performed affect the successful use of system. Finally, they have suggested that systems’ characteristics such as accessibility and information are important determinants for the realisation of a systems potential benefits.

3.5.2 Critical Success Factors for EIS

Young and Watson (1995) have suggested the same three categories - users, organisational characteristics and technical factors for classifying the reasons for the failure of EIS. Under user-related factors they have included: lack of commitment from users, user resistance to hard-to-use technology, lack of clarity by the executive sponsor for the EIS’s purpose, and no provision for executives to communicate ideas and insights. For organisational-related factors their focus is on the support group. Support group who are ignorant of users’ information requirements, not keeping up with the changes in users’ information needs, have inadequate business knowledge, and not addressing a
significant business problem, all contribute to the systems’ failure. Under technology-related factors, they have cited: inadequate and inappropriate technology, complicated interfaces, and the EIS being no better than the system it replaces.

DeLong and Rockart (1986) in identifying the attributes for successful ESS implementation have listed several critical factors that will assure top management acceptance and use of the system. Although they have not explicitly categorise these factors, the attributes identified can be categorised under the three factors of user, organisation and technological factors. For users, they found that a committed and informed executive sponsor is important for the ESS to be accepted. Organisationally, they have observed four critical factors. First, they have noticed that having an operating sponsor who is well acquainted with the executive’s work style and way of thinking will help in defining the executive’s information needs. Second, the ESS project manager must have a good knowledge of the business and be able to communicate with the executive effectively. Third, the ESS group must be able to anticipate and manage the political resistance to the ESS project. Fourth, the group must also be able to anticipate and tackle the data management problems that may arise. Technically they have offered two possible factors. First, the system must contain information that address the business needs of the organisation. Second, appropriate hardware and software should be selected for simple and fast retrieval of required information.

Barrow (1990), in discussing EIS success factors, has proposed that an executive who is forward looking and understands the benefits of an EIS will successfully use the system. He has suggested that having an IS group who can educate the executives on the EIS capabilities will also increase the system’s acceptance. Finally, he has pointed out that the system must integrate information from various sources and has a simple retrieval method.

In a study of thirty-eight EIS users in nine Canadian organisations (public and private), Bergeron et al. (1995) have found that the internalisation of EIS use is again determined by these three groups of factors. Users’ perceived consequences of employing an EIS is found to be the most important variable. Also critical is their experience of EIS.
Organisationally, work group influence plays a very effective role in encouraging EIS use. Technically, sophistication of the EIS products facilitates the use.

Several authors have recognised the importance of user characteristics as a determinant of IT success (McBride and Fidler, 1994; Watson and Glover, 1989; Meiklejohn and Harvey, 1989). McBride and Fidler have written; "The success or failure of an information system and the delivery of benefits are dependent on the people who are using it" (p. 20). They have suggested that user perceptions of the system is very important for them to understand the system. Watson and Glover (1989), in their study of EIS failures, have listed user characteristics such as resistance to technology as one of the major problem areas. Meiklejohn and Harvey (1989) have also pointed to user characteristics as the gauge to a likely acceptance or resistance of EIS. They have put forward factors such as executive work style, approach to problem solving, his understanding of IS and attitude to changes as some of the important factors.

Similarly, a number of researchers have emphasised organisational characteristics as an important factor for successful use of EIS. McBride (1995) has written; "There is a need to understand the organisational context of EIS if we are to judge its success in the organisation and analyse the effects of its deployment" (p. 111). Looking at specific characteristic, Volonino and Robinson (1992) have argued that the organisation's technological maturity is one of the important considerations for EIS acceptance. Armstrong (1990) has emphasised the skills that EIS developers must have in order to develop meaningful systems, a factor in EIS success. He has proposed that the EIS group must not only have technical skills, but also interpersonal skills, business understanding, and tolerance for ambiguity.

As for system's characteristics, many have accepted their importance as a determinant of success. DeLone and McLean (1992), in their IS success model, have proposed system quality and information quality as the factors that will eventually affect the nature of IS impact. Friend (1993) in his study of user acceptance of information systems has tested two system characteristics as the determining factors. These two variables are ease of use and usefulness of system. He found that both are important, although usefulness of
system is shown to be more significant. Some other researchers who have highlighted the importance of systems' characteristics are Watson and Frolick (1991), Houdeshel (1990), Laska and Paller (1991), Watson (1991), Volonino and Robinson (1992) and Barrow (1990).

This means that to realise a certain benefit, one has to ensure that a certain set of characteristics exists with these three factors. Successful realisation of EIS benefits does not depend only on the features of the system developed, not only on the users, not only on the organisational context. Each set of factors has a role to play.

3.5.3 Benefits realisation models
The EIS benefits model has proposed several EIS benefits which are associated with the different categories of executives' activities. The realisation models proposed here are based on these three group of factors. But instead of listing the factors for EIS in general, the realisation models here differentiate the factors for each category of benefit.

3.5.3.1 Benefits realisation model - Learning
Vandenbosch and Huff (1997) have proposed a model which distinguishes between scanning and searching behaviour based on the factors of individual personality, organisational characteristics and a system's features. The model was drawn up based on their investigation of seven organisations. The model proposed several characteristics under each factor that should affect learning.

Characteristics proposed under user differences are tolerance for ambiguity and innovativeness. Tolerance for ambiguity is concerned with the degree to which executives can hold back their need for a perfect, clear view of a situation. It is expected that an executive's tolerance for ambiguity is positively related to their comfort in dealing with vague, equivocal, and qualitative data. Hence an executive with tolerance for ambiguity should be more likely to do more scanning since he is not fearful of the ambiguity that often results. According to Vandenbosch and Huff, although tolerant, an executive does not necessarily like the ambiguities and should thus try to get rid of them. Such a person "seeks it out in order to reduce it: he is tolerant of it only as long as he can do something..."
about it, and his cognitive task is to get rid of it" (Rydell and Rosen 1966, p. 149). Hence, he should do more scanning, trying to understand and learn more about what is happening in the environment.

Innovativeness means the ability to do things differently. Innovators to Kirton (1976, p. 623) are "seen as undisciplined, thinking tangentially, approaching tasks from unsuspected angles; could be said to discover problems and discover avenues of solution; and query problems' concomitant assumptions". Hence, an innovative user is always proactive, finding new ways to do things. He likes to discover new problems and find new solutions to old problems. An executive with this characteristic will more likely scan as he is always on the lookout for new ideas and suggestions.

For organisational characteristic, Vandenbosch and Huff have proposed social influences supporting an information retrieval behaviour as the main factor. Findings from researches on social and cultural influence on the use of EIS have also indicated that scanning would be more prevalent in organisations where scanning is accepted and encouraged (Green and Murphy, 1994; Bergeron et al., 1991). Markus (1994) also has shown the role of social influence in the use of information system. Her study has found that the use of electronic mail is explained more by social influence rather than by the media richness theory.

Systems' characteristics that should support scanning are integration and flexibility (Vandenbosch and Huff, 1997). Integration is an EIS characteristic which has been quoted as an important factor in EIS success (Rainer and Watson, 1995; Rockart and DeLong, 1988). Combining data from multiple sources enables executives to enhance their grasp of their businesses by exploring new cause-and-effect relationships (Rockart and DeLong, 1988). To this effect Rockart and DeLong have quoted a former president of an insurance company;

"We have extended the resources of the ESS to include a large library of public data on our competitors and the industry. This has been particularly useful when matched with our internal data and has significantly deepened our insight into the
problems and opportunities that challenge us as managers. (Rockart and DeLong, 1988,p.319).

Data/use independence and analytic capability is the measure of flexibility. An EIS is flexible if it provides analytic and modelling capability allowing executives to freely analyse the data (Vandenbosch and Huff, 1997). These capabilities should strengthen business understandings of executives (Rockart and DeLong, 1988). Simplicity and meaningful formats should also support the learning capability of executives. As stated by Rockart and DeLong (1988); “Presenting data in flexible formats that can combine text, numbers, and graphics helps many executives understand their businesses by highlighting trends they might not recognise as tabular data alone.” (p.320)

In the study, Vandenbosch and Huff have found that the degree of innovativeness and tolerance for ambiguity were strongly linked to a predisposition toward scanning. However, these alone are not sufficient, and for scanning to take place with the EIS, certain system characteristics and organisational context are needed to provide the facilitating conditions. They have observed that without integration, flexibility and strong social influences for EIS scanning, even executives with a predisposition toward scanning were not likely to scan the information in their EIS.

Knowing and understanding these attributes would assist organisations in taking necessary actions and in developing programs that will improve the realisation of the benefit. As an example, an influential executive may act as a catalyst to promote this type of usage among other executives. Similarly, understanding that multiplicity of sources, flexibility and uniqueness of information as important, actions and procedures can be set up to have a continuous review of information sources, adding and deleting as appropriate, and to train the users in the analytical and modelling capabilities of the system.

Based on these description Figure 3.13 shows the benefits realisation model for learning.
3.5.3.2 Benefits realisation model - Sensemaking

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**Figure 3.13: Benefits realisation model - Learning**

**Figure 3.14: Benefits realisation model - Sensemaking**
The model for sensemaking benefit is as shown in figure 3.14. It is based primarily on Weick and Meader's (1993) article, "Sensemaking and Group Support Systems." In this article the authors have argued that the sensemaking activities are action, affiliation, triangulation, deliberation, and contextualisation. Individual differences that encourage these activities are an individual's belief in group learning, and an inclination towards detailed and thorough reasoning. Affiliation involves discussions and exchange of ideas within the group and triangulation brings together the different experiences, expertise and preferences within the different members of the group. An individual who emphasises detailed and thorough reasoning will ensure that issues are carefully studied and formulated before inducing any plausible patterns. Deliberation in this case is important.

Looking at organisational context, the attributes that will support sensemaking are, the culture of collaboration and cross-fertilisation of ideas, differentiation and perceived environmental confusion. An organisation that has the norm of teamwork will create situations that are supportive of sensemaking. A culture of differentiation will also encourage sensemaking as it will be receptive to the multiplicity of ideas from different sources. Perceived environmental confusion encourages sensemaking activities as deliberation, affiliation and triangulation becomes methods of reducing confusion (Weick and Meader, 1993).

In terms of a system's characteristics, communication support, differentiation and flexibility are important attributes that support sensemaking. Having a system with communication capabilities among its users will facilitate their interactions that are necessary for group work. Differentiation as discussed under the learning benefit provides information variety from various sources which is relevant to triangulation. Flexibility allows the information to be viewed and analysed in multiple ways, simulating various conditions thus supporting an individual's action.

Developing EIS that emphasise sensemaking benefit will then concentrate on providing facilities that will facilitate interactions and finding programs that makes the organisation more prone to group learning and communication.
3.5.3.3 Benefits realisation model - Satisficing

The model for satisficing benefits is as in figure 3.15. Individual characteristic which may favour satisficing in decision making is the ability to deal with complexity, and locus of control. Wang and Turban (1993) have stated that executives who can deal with a high level of complexity tend to consider a broad range of data, to search for large amount of data and to spend more time processing data.

Figure 3.15: Benefits realisation model - satisficing

In terms of organisations, characteristics which encourage satisficing may include culture of information-based decision-making, professionalism of the organisation, and having clear and specific organisational objectives. With a culture of information-based decision making, the organisation encourages decision-makers to probe the facts of a problem or situation further before making any decisions (Kelly, 1994). Even if the final decision contradicts the data, chances are that an exploration of the data will help the decision-maker understand the situation better before a decision is reached. Kraemer et al. (1993) have proposed that managers in more professional governments are likely to place greater importance and credibility in computer based information than those in less professional governments. They make this proposal based on the assumption that appointed
professionals as opposed to elected politicians are more likely to emphasise rational decision-making based on facts. Proper definition of organisational objectives and measures help executives in focusing their attention on issues that are important to the organisation (Kelly, 1994). This ability to focus on important issues facilitates the evaluation and selection of alternatives in the decision-making process.

A system’s features which are likely to support satisficing in decision making are information quality such as timeliness, accuracy, relevance and completeness, differentiation, integration, and flexibility. A system with various modelling and analytical capabilities will allow users to analyse the information giving multiple perspectives of a situation or solutions. This will greatly assist executives in decision making. Zmud (1978), concluded that the key to whether a decision-maker is likely to use formal MIS-generated information is the level of the information’s perceived quality. Relevance, accuracy, reliability, timeliness, completeness and readability measure this. The provision of real-time, accurate and easily accessible information should allow executives to make decisions more quickly (Leidner and Elam, 1995). Differentiation is measured in terms of the information breadth, information depth, external sources, rate of change and information currency. One of the characteristics of an EIS, is that it has information from multiple sources and are constantly updated to ensure timeliness (Watson, 1991; Rockart and DeLong, 1988). The decision making process will also be facilitated with a comprehensive system providing both summary data and background details as support (Dobrzniecki, 1994).

3.5.3.4 Benefits realisation model - Bargaining

The model for realising bargaining benefit is as shown in figure 3.16. Most problems in the business world are tackled by small groups through a process of discussions rather than by individuals working entirely alone. Even where individuals do make the final decision, they often do so based on recommendation or after negotiations with the group. Bargaining becomes the process through which decisions are reached. According to Cyert and March (1963) groups form coalitions. This is based on the assumption that an individual may not have a strong bargaining power, but in coalition with another he has more chance and has validation for his idea. In his article, “Individual differences in
coalitional behaviour,” Ashour (1976) has proposed that personality variables such as conciliation, and risk avoidance are factors that correlate with coalitional behaviour. A person who avoid risks would always form a coalition and make decisions based on consensus so as to avoid sole responsibilities for the possible mistakes. A person who is more receptive to conciliation will also be more prone to forming coalition as this will hasten the process of consensus development.

An organisation which supports teamwork and make decisions through consensus will provide a positive environment for bargaining.

A system’s characteristics which may favour bargaining are communication support and system’s security. Communication support facilitates interaction between the coalition members assisting them in communicating information and the exchange of opinion. For members to use the EIS as a channel to exchange their views and propositions, the system must be secured or at least perceived to be secured. This acts as a guarantee to the users that no sensitive information can be accessed by others outside the coalition.

![Diagram](image)

**Figure 3.16: Benefits realisation model - bargaining**
3.5.3.5 Benefits realisation model - Commanding

The model for commanding benefit is as in figure 3.17. Individual differences which facilitate commanding are legitimate power and endorsement. According to Michener and Burt (1975), legitimate power is a "position-specific" legitimacy. It designates the prerogative inherent in an organisational role. Thus a person with legitimate power may exact compliance due to the formal position that he holds. Compliance to authority may also stem from endorsement. Endorsement is a "person-specific" legitimacy (Michener and Burt, 1975). Describing endorsement, Michener and Lawler have written:

"By definition, a lower-status member is said to endorse a high-status leader if he expresses satisfaction with the leader's performance in directing the group, supports his use of control prerogatives, and wants him to continue in a position of leadership within the group. (Michener and Lawler, 1975, p.216)."

The greater the endorsement accorded to an executive, the more the compliance he can obtain from group members.

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Figure 3.17: Benefits realisation model - Commanding
In terms of organisational context, nature of requests and nature of organisation may be important factors. Justifiable requests may exact greater compliance. A request from a high-status person that serves the collective interest will usually receive more compliance than one that serves selfish interests (Michener and Burt, 1975). An organisation with a hierarchical structure will also provide opportunities for those higher up in the hierarchy to command others down below.

For a system's characteristics, comprehensive and detailed information is important, as well as timely and up-to-date data.

3.5.3.6 Benefits realisation model - Persuading

The model for persuading benefit is as in figure 3.18. The main individual differences which favour persuading are taken from Neustadt (1960). These differences are the executive's reputation, his authority and status, and his public prestige. Reputation to Neustadt does not only depend on the executive's skill and expertise, but also important is the consistency between his words and actions. In other words his credibility is important. Credibility is looked at in terms of the executive's character, care, courage, composure and competence (Rost and Smith, 1992). Under character, honesty, trust and the executive's integrity are important. Under care is the clear concern of the executive with the welfare of others. Composure looks at the executive ability to display appropriate emotion under pressure. Courage means his willingness to change and stand up for his beliefs while competence looks at his technical and interpersonal ability. According to Rost and Smith, (1992) all these five components are necessary to credibility and if any of the components is missing, the overall credibility of the executive is diminished. Authority and status give the executive the bargaining advantages. An executive with a good public prestige and image will be able to have great influence among the people.

An organisational factor which has an impact on persuading is the level of education of the audience. Persuasion is effective if the author's logic is well received and analysed by his audience. Generally an educated audience will be able to logically weigh and analyse arguments presented to them.

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For a system's characteristics, differentiation, integration, flexibility and communication facilities are important. Differentiation gives the user different kind of information and from different sources, increasing his knowledge and widening his understanding which contributes to his competence and thus improve his reputation and credibility. Integration further assists his understanding of certain problems as it brings together related issues and with flexibility this can be viewed and analysed in multiple ways, deepening his understanding.

3.6 Summary
The chapter first looks at several views of EIS. If there is no consensus on the definition of EIS, the reason is that the literature contains three separate ideas concerning the nature of EIS. The chapter characterises these as Executive Retrieval Systems, Executive Support Systems, and Executive Communications Systems. ERS assume that an executive’s chief activity is understanding. ESS assume that an executive’s chief activity is deciding. ECS assume that an executive’s chief activity is implementing decisions. Group Decision Support Systems arise from combining ERS and/or ESS with ECS.
The chapter defines five distinctive features of EIS: a simple interface, integration, improved information, modelling and simulation, and communication. Every category of EIS must have a simple interface and integration. In addition an ERS must have improved information; an ESS must have facilities for modelling and simulation; an ERS must encourage electronic communication.

Next, the chapter evaluates both empirical studies and theoretical explanation of EIS benefits. It concludes that there are two major potential benefits of EIS - improved organisational performance and enhanced reputation of its executives. It then offers a model of the organisational capabilities, mechanisms, behaviours, and outcomes which must be put in place if these benefits are to be achieved.

Finally, the chapter considers the reasons why EIS may fail to produce these benefits. It does this by examining the literature on information systems failure in general and EIS failure in particular. This survey results in a set of models of the critical success factors for different types of EIS. These models suggest tools which a project manager might use to realise the benefits of an EIS.

In the process of developing an EIS benefits management method, the study has looked into the concepts of benefits management, developed a theory of executive work and created generic benefits models for EIS. The next chapter will utilise these concepts and models and propose a method for managing EIS benefits.
CHAPTER 4:

EIS BENEFITS MANAGEMENT METHOD

4.1 Introduction

Benefits management is a process of ensuring that the planned benefits from the use of IT are realised (Ward et al., 1995). It is more than the justification and evaluation of IT investments. Rather than just focusing at specific points in a system's life, benefits management "aims to be the whole life-cycle approach to getting beneficial returns on IS/IT investments" (Ward and Murray, 1997, p.5). It introduces the concepts of planning and effecting changes as well as looking at factors that will support benefits realisation.

Benefits management has three phases: the identification and justification of benefits, the benefits realisation, and the post project evaluation. The initial tasks of the identification and justification phase are examining the requirements for the systems and enumerating the related benefits. This includes stating the benefits in terms of where in the organisation they will occur and who will be affected. This process accesses the value of both tangible and intangible benefits. The subsequent task involves the production of a plan of organisational changes required to ensure benefits are gained and who is responsible for each change. Benefits realisation then is the execution of the plan. The third phase is the review and evaluation of the results. The main task here is to examine whether the planned benefits have been achieved. If there are benefits that have not been delivered, analysis is done as to why this has happened and what necessary actions need to be taken. At the same time analysts identify both unwanted effects and further benefits and decide how to treat each of them. The main objective of this phase is to learn both from success and failure so as to improve benefits realisation.

4.2 Projects and Portfolios

Existing methods of benefits management are project based. They consider the benefits of each project and seek to realise these benefits during the conduct of the project. However, many authorities have argued that the applications portfolio is a more appropriate scope
for the planning and the control of an organisation's information systems than individual projects.

The term applications portfolio refers to the entire set of information systems. These systems may be the set currently in existence within an organisation at a particular moment in time. This is the organisation's current application portfolio. Organisations often undertake a baselining activity in order to document their current applications portfolios. Or the term may refer to the set of information systems which an organisation wishes to build in the future. This is the organisation's planned applications portfolio. A portfolio of potential applications is normally a product of information systems planning exercise.

There are a number of ways to categorise an organisation's applications. Anthony (1965) has described a hierarchical classification based on his levelled model of management activities of strategic planning, management control and operational control. Strategic planning systems help senior managers to define the future of their businesses. Control systems improve cross-functional co-ordination. Operational systems are the basic systems which allow for the routine functioning of the organisation. Ward et al. (1997) describe an alternative categorisation of the types of contribution which IT makes to an organisation. Applications may be strategic, key operational, support, and high potential. Strategic applications are those critical to sustaining future business strategy. Key operational includes applications on which organisation depends for success. High potential includes applications which may be important in achieving future success.

New technologies have a potential impact on each application in the portfolio. In some cases the technologies effect may be great or minimal. In those cases where there is significant potential, there is an opportunity for a new project. Figure 4.1 offers a graphic depiction of the relationship between a project and a portfolio. Each line of this matrix represents a particular application. If the classification recommended by Ward et al. (1997) is used, applications near the top of the matrix are strategic, while those at the bottom are high potential. Each column of the matrix represents the potential benefits of a particular technology to an organisation's entire applications portfolio. It may stand for a
discrete technology such as object-orientation or a combination technology such as EIS which is actually a bundle of the five discrete technologies as described in the previous chapter.

![Diagram](image)

**FIGURE 4.1: Portfolio versus Project**

Every cell of the matrix, therefore, suggests the impact of a particular technology on a specific application. The darkness of each cell is proportional to the magnitude of the impact. Hence, this diagram serves as a means of identifying new projects. A cell which has a very high potential may form a project, (for example cell B2). Or a number of technologies may promise to transform an application radically (for example I3, I5, I7, and I8). Such configuration may form complex projects.

The need to manage an organisation's portfolio of application is just as great as the need to manage individual projects. Ward *et al.* (1990) have written that an analysis of the current applications portfolio gives a great deal of information. It provides an assessment
of coverage and contribution of systems to organisational needs. It tells of the unrealised potential in current systems and enhancements required to increase contribution. Gaining a thorough understanding of the portfolio also enables measurement of its value to the business, and the contribution that systems make towards satisfying business objectives. It can indicate how well the current and future business strategy is supported by the systems. It gives a total picture of current capabilities. Finally it tells of the size and the composition of the backlog and suggests a comparison with other businesses.

Looking at the future applications portfolio helps in understanding the potential impact of technologies on the industry, the corporation and its component businesses. Ward et al. (1990, p. 422-423) have written “[a]pplications should be managed according to their value or contribution to the business.” Management capability and resources are normally in short supply and need to be continuously reallocated to obtain the best business results for the overall portfolio. Balancing the available expertise with the portfolio needs is critical to long term success (Ward et al., 1990).

If an application is contending with others for the limited resources, then it must show a good economic return for the allocation of scarce resource. Looking at a portfolio, priorities can be set across applications. This should lead to an optimal use of available resources. This allows the ranking of proposed projects according to their potential effects on the organisation. With the portfolio approach of Ward et al. each application is classified according to its existing or anticipated contribution. Then each application can be managed in accordance with that contribution. The four categories will require quite different strategies to achieve successful planning, development, implementation, and operation of the applications because each fulfils a different role in an organisation. For example, relational database technology is appropriate for strategic systems; traditional systems development life-cycle methods for key operational systems; packaged software products for support systems; rapid development approaches for high potential systems.

Hence looking at applications on a portfolio basis provides advantages in terms of their planning, development, and implementation. Similarly for benefits management, focusing on a portfolio is more effective than dealing with only individual projects.
4.3 Shortfalls of current benefits management methods

There are four major reasons why current benefits management methods such as that of Ward et al. are unsatisfactory in the case of EIS projects. These reasons arise from the focus of the method on a project by project basis rather than on a portfolio of applications.

a) Cost of Creating Benefits Model
Since every project is treated individually, the construction of the benefits causal model is time consuming and requires much user involvement. In the method proposed by Ward et al. each new project involves the drawing up of a new benefits plan. Each project requires discussions with stakeholders in order to identify the benefits and to draw up the benefits dependency chart. This is impractical for executives. However, EIS is a technology which may impact many aspects of an organisation and therefore many projects. Therefore, there is no need to undertake benefits identification for each EIS project.

b) Cost of Creating Realisation Model
Since each project is considered on its own, there is a need to draw up benefits realisation plan for each project. Identifying the changes necessary for the delivery of benefits requires much time and manpower. However, if there are generic benefits identified, there will be common success factors for the benefits. Hence, standard realisation models are possible.

c) Lack of Organisational Learning
If a project is considered as an isolated undertaking, there is a real likelihood that lessons concerning benefits management and realisation learned on a project will not be absorbed by the entire organisation. Each project will likely start without reference to previous projects, even though there may be similarities in terms of the objectives, the benefits and the success factors. Having standard benefits and implementation models may serve as a basis for organisational learning.
d) Method is only applicable at the outset of projects

The Ward et al. method applies at the outset of a project. The method starts with the identification of benefits for the project and progresses on to a plan for their realisation and implementation. It ends with a post-implementation review. It is therefore not suitable for an existing project which may want to evaluate its achievement, but may not have undergone the earlier stages of the benefits management process.

A portfolio-orientation overcomes these shortfalls in the current benefits management methods in the following way:

a) A Standard Benefits Model Reduces Costs

New technologies are the source of benefits. New technologies apply to an entire portfolio not a single system. In this way a standard benefits model covers all categories. Having a standard benefits model allow a more efficient means of identifying benefits. There is no need to draft a new benefits model for each. The portfolio approach exploits similarities of needs and common routes to benefits delivery. Earlier chapter of this study has proposed six types of executive work. The effect of EIS differs for each type. Figure 4.2 reiterates the EIS application portfolio.

![FIGURE 4.2: EIS Applications Portfolio](image-url)
The previous chapter proposed a causal map of EIS benefits indicating changes and outcomes at different points in an organisation together with the final benefits. From this composite causal map, a causal map for each category of the applications was derived in the portfolio. These causal maps of EIS benefits serve to help identify benefits for current or potential EIS applications.

b) *A Standard Benefits Realisation Model Reduces Costs and Increases Control*

Similarly, for each category of EIS application in the portfolio above there is a realisation model. Each model consists of success factors necessary for the delivery of the outcomes and final benefits of the EIS investment. For example, an EIS application which has an impact on learning will have success factors that will facilitate the delivery of the related benefits. Hence planning for benefits realisation for applications within the same category will be speeded up as the same model can be deployed.

c) *Standards Models Improve Organisational learning*

Lessons learnt from one project can be extended to another. Sharing the advantages gained from one project to another may accelerate how to achieve the benefits available, even if the details of the application vary. It will ensure opportunities are not missed or resources and funds needlessly wasted. Mistakes made in previous projects need not be repeated. Standard benefits causal models for each category of the EIS application portfolio and their respective realisation models become the basis of learning.

d) *Method will be Applicable at any stage of Project*

A Benefits Management method that is suitable only for projects that are starting will be less useful than a method that is applicable at any stage of a project. The proposed BM method is developed not only for new projects but also to be employed by existing applications. Hence it can be applied at any stage of a project lifecycle. This also means that the method is also appropriate for alternative development approaches such as prototyping where requirements may change rapidly.
4.4 Proposed EIS benefits management method

4.4.1 Overview

Figure 4.3 shows the process model of benefits management proposed in this dissertation. This model is a modification of the process model of Ward et al.'s (1995). For organisations which are introducing EIS technology for the first time, the proposed method starts by looking at the potential impact of EIS. If the technology is already in use, then the method starts by creating a baseline of the current impact of the technology.

![Diagram of Modified Process Model for Benefits Management](image)

**FIGURE 4.3: Modified Process Model for Benefits Management**

The EIS benefits model shows the potential impact of EIS technology on both the organisations and the executives. Focusing on the potential impact of EIS provides knowledge of the areas where EIS will have an impact. This allows for identification of potential projects.
The creation of the baseline provides a set of potential projects and the potential impact on both the organisations and the executives. It suggests the overall status of current applications, indicating those which are successful and those which have not delivered their potential benefits.

This will lead to the next step, that is the selection of project from the portfolio.

Once a project has been selected, the third step is to undertake it. This requires the incorporation of benefits management concepts into traditional project management techniques. The proposed method adopts the process model of benefits management developed by Ward et al. (1995). However it incorporates the reuse of standard models in place of the development of unique benefits models for each project.

There are three main phases in the process. The justification phase, the realisation phase and the post project evaluation phase. Figure 4.4 shows the process model of a project employing the proposed EIS management method.

The justification phase consists of two processes, identifying benefits and planning for benefits realisation. The process of identifying benefits now simply requires the selection of the appropriate EIS benefits model. The model provides the range of potential benefits that may be realised with the development of the EIS application. The process of benefits structuring is not necessary as the EIS benefits model employed at this stage will show the causal linkages from the initial technology investment to the end benefits. Planning for benefits realisation involves the use of realisation models to guide planning activities. Each EIS benefits model has an associated realisation model. Responsibilities for the realisation of benefits must be assigned to named individuals.

The realisation phase involves the execution of the benefits realisation plan. Every individual assigned with the responsibilities has to carry out the assigned tasks. The EIS benefits model will be employed together with the realisation models to act as referential guides as to the implementation.
The evaluation phase is where the system is examined as to whether the promised benefits have been realised. Both the EIS benefits model and the realisation models will form the measure. Benefits realised in the project will be compared against those projected in the benefits to see whether there are any variances. The realisation model should point out why benefits remain unrealised.

4.4.2 Identify Impact

In cases where EIS technology is new, we need to look at its potential effects on the organisation. The process includes analysing the effects of each of the EIS components. For instance what and how will a good user interface and better information affect the performance of the organisation? In what way will a communication facility help executives in their work? What areas of executive work will be affected? A portfolio of applications can be planned and categorised according to their impact on executive work. The EIS benefits model will show the impact of BIS.
4.4.3 Create baseline.

For organisations with existing EIS technology the method starts by setting the base line of current applications. This involves evaluating the existing portfolio of applications. Ward et al. have written that evaluating current portfolio will lead to the following deliverables:

i. assessment of coverage of systems' contribution;

ii. unrealised potential in current systems;

iii. common elements between current portfolio and required information and systems architecture. (1990, p. 173);

iv. differences between current portfolio and required information and systems architecture.

Similarly, the objective of the base line study is to gather the status of existing EIS applications in terms of utilisation and benefits. It is the aim of the study to assess to what extent the present applications fulfil the stated requirements. The manner of conducting a baseline study used in this method comes from the work of Belcher and Watson (1993) who assessed the value of EIS in Conoco. The Conoco study was thought to be suitable for several reasons. First, the baseline study was an evaluation of EIS in an organisation. In Conoco, it was also an evaluation project. Secondly, it looked at the entire portfolio of EIS applications. Thirdly, the objectives of the project in Conoco were to identify: the users of the system; user requirements; low-value applications; applications that should be enhanced or added; a cost benefit analysis. These map nicely with the objectives of the proposed baseline study. Fourthly, the methods used in the Conoco project were not dependent on any unique organisational characteristics. Hence, the methods of data gathering in the Conoco project should be applicable for the baseline study.

The baseline study evaluation starts with the collection of usage statistics which reveal executives who are using the system and the frequency of their utilisation. Usage is an
important factor in the evaluation since it indicates the beneficial impact of EIS. DeLone and McLean (1992) in their model of IS success have suggested that the more frequent an IS is used, the more satisfied is the user. Hence the more successful the system is. Leidner and Elam (1995) and Leidner (1996) have found in their survey of EIS impact that the frequency and length of EIS use is positively related to decision making speed, mental model enhancement and the extent of analysis in decision making. However, frequency of use alone is not successful use (Leidner, 1996). How executives make use of each application is also important. The evaluation therefore involves interviews with users, developers, and the support group. The purpose is to determine how the EIS is used and what benefits arise from the usage. Executives who are targeted to use the system but have not been using it are also interviewed. Reasons for their action may reveal certain negative factors which have been overlooked. Using these interview data and the usage statistics collected earlier, a review is prepared for the system. The main items in the review are:

i. the name of the application;
ii. average access per month;
iii. main executive users;
iv. basic purpose of the application;
v. original function replaced;
vi. System’s characteristics;
vii. Exceptional costs to support the application;
viii. Quantifiable benefits;
ix. Intangible benefits;
x. Any negative outcomes.

The base line study produces a list of EIS applications which are regularly utilised and which give benefits to users. At the same time it also identifies applications which are rarely used and have not achieved their original objectives. The study may also reveal the need of new applications.
An additional task of this baseline study is to categorise the portfolio of applications. Here this uses the model of executive work. Each system is examined in terms of its purpose and functions and the clients it is supposed to serve and determines how it will affect the work of an executive. This allows an application to be categorised as a learning application if its main objective is to support executives’ learning. If the application is used to help in group learning, then it is categorised as sensemaking. An application which has the objective of aiding an executive’s decision making is categorised as satisficing. When an application extends the decision making support to a group of executives, then it is classified as bargaining. An application which is deployed to help an executive in executing commands is categorised as commanding. An application is categorised as persuading if its objective is to assist in an executive’s rhetorical ability.

4.4.4 Select project
With the portfolio of applications, the subsequent step is to select a project. Based on the portfolio, an application can be selected according to user priority or depending on resources such as manpower, data, and technological availability. Ward et al. have suggested three factors that need to be included in the setting of priorities;

a) what is most important to do - benefits
b) what is capable of being done - resources
c) what is likely to succeed - risks


These factors allow for weighting the project. The result will be a ranking of all the projects. With EIS projects user priorities are critical. However, it is also important to consider the availability of resources such as expertise. With existing EIS projects, an application which has delivered very little of its potential benefits can be chosen, an application which has the greatest potential impact, but still has potential benefits to deliver can be chosen, or a newly identified application can be chosen.
4.4.5 Perform The Project

4.4.5.1 Justification

4.4.5.1.1 Benefits identification

The main objective of this phase is to identify and to understand the benefits of the system, both current and potential. Existing methods have suggested several ways of identifying benefits. These include expert opinion, in-depth interviews, the Delphi technique, observation, benefit profile charts and existing systems review. Ward et al. (1997) have proposed the study of business objectives as one of the major steps in benefits identification. In this proposed EIS BM method, this stage requires only the selection of the appropriate EIS benefits model. The causal model of EIS benefits described in Chapter Three explains the effects of EIS technology on organisations. It shows the relationship between each of the five components of EIS technology and the benefits of EIS. It indicates organisational variables that are involved in the process of realising potential benefits. The causal map describes the capabilities and the organisational mechanisms and behaviour resulting from the introduction of EIS. It explains the outcomes and the end benefits of the system. Each type of executive work relies on only some features of an EIS. Within the context of a particular type of an executive work only some of these technologies, capabilities, mechanisms, behaviour, outcomes, and benefits apply. Hence, there is a specific benefits model associated with each type of executive work.

Having categorised the application earlier, the selection of the appropriate causal map is straightforward. For example, if the application is a learning one, then the causal map of the effects of EIS that correspond to learning is chosen. In this example, the two EIS features that are important are easy-to-use interface and improved information. These two features enable changes in organisational capabilities and behaviour which lead to increased responsiveness and increased depth of understanding and finally, result in improved organisational performance and the enhancement of an executive’s reputation. For an existing application, the current benefits can be compared with the benefits hypothesised in the related causal map. Checking the presence or absence of certain organisational capabilities or behaviour can identify unrealised benefits.
The difference between the benefits identification process in this proposed method and the existing methods of Ward et al. (1995) and of Cotton and Hogbin (1995) is that the causal maps employed here provide generic benefits that are applicable to all EIS applications of the same category. In this case, the causal map as shown in figure 3.7 is applicable to all EIS applications which are developed to help enhance the learning capability of executives. Hence, benefits identification is simple. There is no necessity to structure the benefits as the structure is implicit in the respective causal maps. The maps have laid out the enablers and the intermediate outcomes necessary to achieve the final benefits. For existing methods, the process of benefits identification and benefits structuring has to be repeated for every project. The benefits dependency network (Ward et al. 1996) and the value linkage diagram (Cotton and Hogbin, 1995) have to be drawn for each new project. In the proposed method, this is unnecessary.

4.4.5.1.2 Planning benefits realisation

Having identified the benefits of a particular EIS, attention needs to be focused on how to realise these benefits. As stated in Ward et al. (1996), the main objectives of this stage are to produce an action plan to realise the benefits, to identify and understand the changes required, and to assign responsibilities for these actions. Under existing BM method, detail study needs to be conducted to identify the factors and the changes required to realise the proposed benefit. Much time is spent in meetings and workshops for this purpose. However, in the proposed EIS BM method, the realisation models facilitate the process. For each category of the EIS application portfolio, there is a corresponding realisation model. The success factors in the model become the guide in ensuring that the capabilities and changes laid out in the EIS benefit model become a reality.

Planning for the realisation of EIS benefits on learning

The causal map of the effects of EIS on learning shows that the final benefits are higher performance and enhanced reputation. These two benefits are the results of causal effects of a range of organisational capabilities, mechanisms, behaviour and outcomes as shown in Figure 3.7. A corresponding benefits realisation model for learning have put forward three groups of factors that will facilitate the delivery of the benefits. These are user,
organisational and system characteristics. Hence, the plan for benefits realisation starts with the analysis of these three groups of factors to see whether an organisation has the necessary characteristics. Knowing those with appropriate characteristics helps in identifying potential support. Those lacking the characteristics may be those who will not use the system in such a way as to achieve the benefits. In these cases, plans to train and educate users of the system in such a way as to achieve accelerated cognitive processing, making use of the wider range of variables and taking advantage of the multiple simultaneous alternatives, have to be drawn.

A study on the organisation is made to see whether the supporting attribute for learning is present. A social environment which encourages learning will be very helpful and this facilitating factor should fully be made use of. The benefits realisation model is employed to ensure that the technical enablers will have the necessary features hypothesised in the model. Specification of the user interface should emphasise simplicity and flexibility. Steps have to be taken to get information from multiple sources and the design group needs to consider how they can integrate the data with other relevant information. The system must also provide the appropriate technologies in this case.

Planning for the realisation of EIS benefits on sensemaking
The causal map of the effects of EIS on sensemaking again shows the final benefits of higher performance and enhanced reputation. However, there are differences in the EIS features and the organisational capabilities and mechanisms that are involved. The plan for benefits realisation starts with the analysis of the success factors for sensemaking as proposed in the benefits realisation model. To achieve the organisational capabilities of low conflict which will lead to openness, which then lead to smooth group process, confidence to act and comprehensiveness, the realisation model indicates that users must believe in group learning and have inclinations towards detailed and thorough reasoning. It is important to identify users having these characteristics and those lacking them. Training and educational programmes on the benefits of group learning can be prepared. Management attention can be drawn as to the need for special programmes, if the investment is to deliver the expected benefits. Similarly, there must be a study on the organisation to check whether the supporting attributes for sensemaking are present.
culture of teamwork is an asset. Otherwise awareness programmes will be helpful. In terms of technical characteristics, it is important that there are communication support, the information is differentiated and there is flexibility in the interface. Design and specification of the system must ensure that these features are included.

Planning for benefits realisation on satisficing
The realisation model for satisficing hypothesised that individuals who can deal with complexity and have internal locus of control will be more prone to analyse information in their decision making process. They will, for example, make use of a wider range of variables from a wider variety of sources and are comfortable in analysing multiple alternatives. It is, therefore, important in the planning process to know these individual differences. This allows training programmes to be tailored. Those without these characteristics may be put on a one-to-one training programme highlighting the capabilities of the application with its easy-to-use interface and improved information. Complex modelling and simulation programmes may be initially reserved for users who can profit from them. It is also important to look at the overall organisational characteristics to see whether there are existing features within the organisation that are supportive of satisficing. A continuous educational programme highlighting the benefits of informed decision making may be planned. This may be implemented through appropriate articles in monthly newsletters. Having clear and specific objectives are also important, as they should facilitate the evaluation and selection of alternatives in the decision making process. Management attention must be drawn to the importance of this issue. Technically, the system must have modelling and analytical capabilities and the information it contains must be timely, accurate, relevant and complete. The sources of these data must be identified and the timing of their entries and updates must be planned.

Planning benefits realisation for bargaining
The model of benefits realisation for bargaining indicates that the individual characteristics of conciliation and risk avoidance should support bargaining activities. An organisation which encourages teamwork and consensus should provide a positive environment for bargaining. The lack of these characteristics necessitate programmes that will create awareness. The support group has to plan for training programmes that will
emphasise the capabilities enabled by the technological features. They have to elaborate the outcomes and benefits of these features, so as to increase users' understanding and appreciation. Technically, features such as communication support and security are identified as important. Therefore, these must be included in the system's specification.

Planning benefits realisation for commanding

The model of benefits realisation for commanding suggests that legitimate power and high endorsement are some of the factors that assist executive command. There is nothing very much that can be done to assist users in acquiring these two individual factors. However, technically EIS can provide assistance in the commanding role. Having detailed and timely information about the implementation of certain actions would help executives in monitoring the progress of their commands. These exception reports must be planned. The person responsible and the skills which he needs to have must also be identified.

Planning benefits realisation for persuading

Individual characteristics to support an executive's ability to persuade are his reputation or credibility, his authority and status, and his public prestige. An EIS can help to enhance the ability by providing the executive with much information from a variety of sources. This differentiation of information widens his understanding and assists him in comprehensive decision making. Therefore, it is necessary to identify the variety of information and their sources. The system has to be designed to provide integration and flexibility of presentation. Training programmes are needed that will highlight these benefits.

This process of matching and analysing the whole range of variables in the benefits model with the realisation model reveals the conditions and the necessary changes and actions that need to be taken to realise the potential benefits. Action plans have to be drawn for all these activities. The next step is to assign responsibilities for all the tasks. It is necessary to obtain agreement and commitment from these groups as to the changes and actions that need to be taken. Project plans should be produced identifying the activities and the timing. Similar to existing methods, there is a need to develop a
benefits review procedure. This procedure will describe the review processes that will be employed to monitor the progress of the benefits delivery.

In this proposed EIS BM method, the benefits realisation models facilitate the analysis as to the conditions and factors that are important for the delivery of the EIS benefits. This helps in the drawing up of appropriate plans and actions. With the existing benefits management methods, there is no realisation or success factor model that is used. Hence, much effort is spent analysing necessary changes required for each benefit. These current methods also seem to assume that the proposed system will be developed with all the technical features necessary for the realisation of the benefits. There is no mention of technical changes or necessary system features. The proposed EIS BM method makes explicit the technical characteristics required.

It is easier to justify the project at the end of this phase. The benefits are listed and rationalised with the type of work that executives do. The plans to achieve them are laid out together with the people and other resources responsible for their delivery. It is therefore possible at the end of this phase to produce a cost benefit model for the project.

4.4.5.2 Benefits Realisation

4.4.5.2.1 Execute the benefits realisation plan

Executing the plan involves carrying out actions as detailed in the benefits realisation plan. Each person assigned to the tasks has to ensure that the tasks are implemented. The system needs to incorporate the necessary features. The support group has to spend time improving their understanding of the new system. They should introduce executives to the system and train them to beneficially use it. The project plan has to allow sufficient time for these activities to take place. Commitment from all responsible is necessary. Ward et al. (1996) have said that much of this stage is concerned with "people" issues and therefore communication plays a very important role. Good communication is essential in promoting the system and training the executives.

Review is important here to check on the progress of the implementation and on whether the plans need revision. Timing may need to be changed and resources, such as
manpower, may have to be altered. At the end of this stage the executives should be using the system and receiving the stated benefits.

4.4.5.3 Post Project Evaluation Phase
4.4.5.3.1 Evaluate results
The main objective at this stage is to check whether the proposed benefits have been realised. The review will reveal any benefits not achieved, the reasons for it and the necessary actions required. The project plan must include the implementation phase. This allows for the time required to realise the benefits. The process employs both the EIS benefits model and the realisation model. The degree to which benefits have been realised is done in a similar manner to the approach used in the baselining task. The realised benefits of the system are then compared to the potential benefits listed in the EIS benefits model. This reveals whether there are any variances. There may be some benefits which have not been achieved, and some unexpected benefits which have been realised. At the same time this process will also highlight any unfavourable outcomes. The introduction of an electronic mailing system, for example, may have resulted in executives being bombarded with much unnecessary mail that they have to spend time filtering them.

The benefits realisation model is used to analyse what factors are actually important in the benefits realisation. Certain factors may not have any correlation or they may have contributed to other unexpected benefits. The review may reveal certain other factors which may be relevant. It may on the other hand indicate that the factors are right, but the programme or the actions taken are not effective. As an example, information integration may be a success factor for the system and plans are made for its implementation, however, the effort put in may not be adequate. As a result of these, changes are made to the original plans and new plans may need to be drawn up.

Current benefits management methods depend very much on the measurement of outcomes - before and after, to evaluate the achievement of benefits. This may be easy for measurable benefits, but may prove problematic for those intangible benefits. The use of the benefits model and the realisation model may be more appropriate for these cases.
The benefit model acts as a measuring guide as to the benefits that can be achieved and the realisation model gives the diagnosis on why they are not realised and how these can be corrected.

4.4.6 Revise models

The evaluation of the project indicates not only plans which are not appropriate, but also may reveal certain flaws in the various models. These falsified models need revision. The achievement of a new benefit may change the EIS benefits model. Repeated non-delivery of a benefit may prompt us to track down the model and reanalyse the causal organisational mechanism and behaviour. The realisation models may be changed as the success factors that we hypothesised may not be the right factors.

The revised models become input to subsequent benefits management experiments. The cycle continues to test new plans and new variables. The EIS benefits model and the benefits realisation models will be adapted and enhanced as appropriate. This will continue until some kind of stability is reached. This is when the potential benefits listed are realised and agreement is reached for unrealised benefits that these are unachievable.

4.5 Summary

The chapter proposes an EIS benefits management method which is broadly based on the benefits management method proposed by Ward et al. (1995). It starts with a review of the process of benefits management and continues with problems of EIS benefits management and the limitation of current benefits management methods. It then discusses each stage of the proposed EIS benefits management method highlighting the differences with current methods.

Having proposed a method, the study needs to test its applicability within some organisations. The approach taken to test the applicability of the proposed method will be the focus of the next chapter.
CHAPTER 5:

RESEARCH METHOD

5.1 Relevance and Rigour in Information Systems Research

The research approach adopted in any study depends on the nature and the objectives of the question investigated. Information systems is a practical subject, like law, medicine, or architecture. It is not a theoretical subject, like philosophy, physics, or economics. The practice of information systems concerns action and instruments to aid action. Utility is the measure of research into information systems practice. The focal point of sciences is contemplation. Verisimilitude is its measure. This distinction poses problems for those undertaking research in information systems, particularly for a doctoral candidate.

Keen (1991) has drawn the implications of this dilemma precisely in contrasting relevance and rigour in IS research. He has argued that the information systems community shares a belief that its research is purposive, that is "...it is intended to influence action in some domain, such as public policy, systems design and implementation methods, education, management decision making, or information systems planning." (p. 27). Hence, Keen has suggested that IS research can only be judged on the impact which it has on the audience to which it is addressed. If the research is not seen to be "relevant" by the intended audience, it can not have its desired effect. However, research must be more than relevant to have an impact. It must also offer evidence which is persuasive to the chosen audience and different audiences have different standards of proof. Keen has used the term "rigour" to refer to the standard of logic which is characteristic of proof within a particular audience. Thus, Keen has concluded that without a notion of who the audience (that is, what is relevant) it is impossible to know what is persuasive (that is, what is rigorous). A logical argument in the context of one audience may not be persuasive to another audience.

A major problem of IS research is that it has, at least, two audiences. If it is to improve the practice of information systems, practitioners must find it both pertinent and persuasive. If it is to be accepted as a worthy contribution to the literature on information systems, IS academics must judge it to be relevant, but more importantly to be rigorous.
Unfortunately, there is no consensus on what constitutes rigorous research in the academic IS community. This is because there is no dominant paradigm. There are rather a number of competing paradigms. Hence, every IS researcher must expect there to be both sympathetic and hostile members within his academic audience. The situation within the practitioner community is equally difficult. Information systems are largely the products of handicraft rather than an engineering profession. Practitioners are more likely than not to ignore recommended standards. It is still all too possible to profit by making systems which are late, which greatly exceed estimated costs, and which do not work. Hence, it could be argued that for the academic community standards of rigour vary and that for the practitioner community the meaning of rigour is very ill-defined.

This chapter discusses the philosophies underpinning IS research. It considers the major approaches to IS research and the standards of proof and of evidence each requires. It also examines how these criteria differ from the need to demonstrate the practicality of the research and describes how the instrumental nature of the study influences the research method used. Once this background has been provided, the chapter lays out the proposed method for conducting the study.

5.2 Philosophies of IS research
Most IS research depends on one of four philosophical schools: rationalism, positivism, interpretivism, or pragmatism.

5.2.1 Rationalism
The starting point of rationalism or the hypothetico-deductive method is that appearance is unreliable. Our senses may deceive us. They do not necessarily allow us to see the true order which underlies nature. We can only discover the hidden causal mechanisms which cause sensory phenomena by means of our own mental powers, that is by insight. These physical theories or laws form the substance of reasoning. The process of logical deduction from these first principles produces testable implication. The term rigour within the context of rationalism usually refers to consistent logical deduction. This favours theories, laws, and models, which can be expressed mathematically because they can be manipulated with exactness.
This emphasis on formal deduction does raise problems though. While the account of his analysis is crucial to a rationalist's argument, his means of generating self-evident propositions (that is his process of induction) is somewhat mystical. There is, in fact, much evidence which suggests that rationalists regard induction as a special case of imagination or serendipity (e.g. Holton, 1973). Intellectual intuition, as Descartes refers to it, seems neither objective nor teachable. (Hollis, 1994, pp. 30-32).

Another difficulty of the doctrine of rationalism is its incorporation of realism. This tenet holds that there is a single reality which is independent of our perceptions. A rationalist gains knowledge of this world by using his intellectual intuition to model it in the form of causal laws. These laws explain reality. He, therefore, assumes a correspondence theory of truth, that is the truth of a law depends on its exact correspondence to the world (Tarski, 1972). Hollis (1994, pp. 34-37) has also pointed out that this accounts for the rationalist's tendency to confuse the necessities of thought, ideas, language, and numbers with causality in nature. Hence, laws do not just explain, they also predict.

In order to address this criticism rationalists advocate the testing of their deductions by means of controlled experiment. In practice though they often leave this step to others. This procedure may lead to the confirmation of a deduction and hence, may improve our confidence in a proposed law. On the other hand, it may lead to the denial of a deduction and hence, it may destroy our confidence in a proposed law.

Popper (1969) has gained much notoriety by criticizing the traditional interpretation of the testing of hypotheses. If the successful testing of a deduction by means of controlled experiment may increase our confidence in it, then repeated testing should verify a theory beyond reasonable doubt. This means that repeatability is an important characteristic of any experiment. Yet, Popper has argued that a theory can not be confirmed by any experiment because testing can never exhaust all of its possible applications. He has observed that it is easier to disprove a theory though, for this can be accomplished by a single negative result. Therefore, it is important that scientists produce hypotheses which can be refuted by experiment. An unfalsified deduction is not true, but has not yet been shown to be false. Therefore, our confidence in it is tentative.
The process of testing deductions offers problems as well. In their classic textbook, *An Introduction to Logic and Scientific Method*, Cohen and Nagel have written:

> Every experiment, therefore, test not an isolated hypothesis, but the whole body of relevant knowledge logically involved. If the experiment is claimed to refute an isolated hypothesis, this is because the rest of the assumptions we have made are believed to be well founded. But this belief may be mistaken. (1934, p. 220)

Of course, the failure of an experiment is as likely to indicate that it has been ill-conceived as to falsify a theory. For this reason the term rigour within the context of testing usually refers to the design and conduct of experiments. This is why novice researchers must learn to conduct experiments which are free from fault.

There are many examples of rationalist research in the IS literature. For example, much of the IS research which deploys economics as a reference discipline is rationalistic in philosophy. Barua's, Kriebel's and Mukhopadhyay's paper "An Electronic Analysis of Strategic Information Technology Investments," (1991) is an illustration of a rationalist approach to information systems research. In this paper they have developed an econometric model of competition in markets for electronic services. Their initial assumptions are commonsensical and their model is algebraic. From their model they have deduced eleven propositions. Most notably, they have predicted that there are incentives to IT-inefficient firms to be technological followers and that there has to be sufficient IT cost differences for an IT-efficient firm to innovate. They also have predicted from their model that switching costs reduce customers' benefits, but their effect on industry profit is indeterminate. However, they have offered no experimental evidence to support either their model or their deductions. They start from self-evident propositions in order to build a mathematical model of markets for electronic services. Their deductions are logically consistent with their initial propositions.

Another typical piece of rationalistic IS research is Clemons' and Row's paper (1991) "Sustaining IT Advantage: The Role of Structural Difference." In this article the authors have combined a resource-based theory of innovation advocated by Teece (1987) with Transaction Cost Economics (Williamson, 1975) in order to argue that information
systems can provide competitive advantage in two circumstances. The first is when there are strong first mover effects because of rapid customer adoption, slow competitor response or significant switching costs. They have claimed such circumstances are rare. The second is when an IT-based innovation exploits unique resources which competitors do not have. This occurs because “IT changes the value of key resources by reducing the cost of integrating and coordinating economic activities” (p. 289).

Clemons and Row have not begun from self-evident propositions. Instead, they have adopted two theories both of which have an established following within the community of economists. This provides a warrant for their theoretical position. However, neither of these two theories is mathematically expressed. Therefore, Clemons’ and Row’s model is qualitative and not so rigorous as an extreme rationalist might require. Moreover, they do not support their deduction with controlled experiments because it is virtually impossible to test economic assertions within real companies. Lee has suggested that this handicap may be overcome by using “natural controls” inherent in the organizations which are being observed (1989, p. 39). However, Clemons and Row provide only brief case studies to illustrate the points which they make.

An even more common use of rationalist methods occurs in IS research which proposes new notations for systems analysis, design or programming. Chen’s paper entitled “The Entity-Relationship Model - Toward a Unified View of Data,” (1976) is a well-known illustration. In this article he has presented a notation for modelling organizational data and has suggested it as a tool for logical database design. He has argued that entities and relationships are sufficient concepts to model the data in any computer application. He has shown that entities and relationships have their foundation in set theory and he has offered an example of this approach which demonstrates how it can be used in database design.

Chen has argued that his entity-relationship model is preferable to other modelling notations because it allows for the capture of semantic data which other notations can not and because there is a clear correspondence between the model and the real world. He is also at pains to demonstrate the mathematical underpinning of the notation.
In short his approach sees software development as a special instance of the hypothetico-deductive process. Analysts create formal models of a domain written in Chen's entity-relationship notation, a quasi-mathematical language. Chen does not describe how this task is performed. He assumes that it depends on "intellectual intuition". Using logical operators, analysts may elaborate these models to determine the structure of a database. One might argue that the case of a project-based enterprise which Chen uses to illustrate his approach offers a simple demonstration of his premise about the applicability of his notation.

Hence, Chen's paper illustrates a rationalistic view to research into information systems practice. Here he not only poses an hypothesis - entities and relationships provide an excellent notation for modelling organizational data and a worthy tool for logical database design. He assumes that the information systems practice is a rational activity consisting of devising and testing hypotheses.

In his book *The Reflective Practitioner* Schön has claimed that technical rationalism is the most common philosophy of practice. He has described this simply as "problems of choice or decision are solved through the selection, from available means, of the one [scientific theory] best suited to established ends" (1991, p. 39-40). However, he has argued that unrelenting application of technical rationality has caused a loss of confidence in professionals. He has indicated that the reason for this is by concentrating on problem solving, practitioners overlook problem setting - "the process by which we define the decision to be made, the ends to be achieved, the means which must be chosen." (1991, p. 40). Problem setting poses a particular difficulty for technical rationality because it depends on an agreement about ends. When the ends are confused or conflicting, there is no problem to solve. Schön has proposed that a conflict of ends can not be resolved with theoretical knowledge, but only through a "non-technical process of framing the problematic situation which allows us to organize and to clarify both the ends to be achieved and the possible means of achieving them." (1991, p. 41). Schön has described the dilemma which this causes the practitioner who adopts technical rationality in this way:

> In the varied topography of professional practice, there is a high, hard ground where practitioners can make effective use of research-based...
theory and technique, and there is the swampy lowland where situations are confusing "messes" incapable of technical solution... [When] professionals opt for the high ground. Hungry for technical rigour, devoted to an image of solid professional competence, or fearful of entering a world in which they feel they do not know what they are doing, they choose to confine themselves to a narrowly technical practice. (1991, pp. 42-43)

5.2.2. Positivism

In contrast to rationalism, empiricism advocates that we can only reliably know what we have observed. Knowledge does not begin with insightful theories, but with experience. Conjectures arise from familiarity with phenomena. They are not pulled from the ether. Insight results from hours of watching, not from serendipity. In respect to discovery empiricists differ from rationalists, but both do agree on the need to draw out and to test the implications of theories.

Positivism is an extreme form of empiricism. Kolakowski (1968, pp. 3-9) has suggested four rules which characterize positivism. The first is phenomenalism which is the doctrine that experience is the only thing knowable. Reason is not a reliable source of knowledge. The second is nominalism which is the doctrine that a theory can refer only to the objects of experience. This means that abstractions such as matter and force are only words; they have no meaning. While theories should depict the relations observed among phenomena, they should not depend on models of hidden mechanisms in order to explain the causal relationships among the phenomena. The third is the denial of value judgments. This means experience contains no qualities such as "good", "beautiful" or "noble". These are not suitable objects of certain knowledge. The fourth is naturalism which is the doctrine that the scientific method (i.e. empirically-based hypothetical deduction) is applicable to the social as well as the natural world.

Positivism overcomes one of the major problems of rationalism. It offers a systematic approach to the initial formulation of hypotheses. This is induction which is the principle which allows individual perceptions to be generalized. As Hollis has written "[i]t lets us infer that what has been found true in known cases so far also holds in other cases where
the same conditions obtain" (1994, p. 45). This means, at best, theories induced from observation are only probable. This raises other problems.

First, what is the warrant for the principle of induction? Why should it be true? Positivism assumes that individual perception is the only basis for knowledge. Induction must apply to all perception, both past and future, but individuals can not know anything about experiences which they have not yet had. Therefore, the principle of induction must rest on faith, not knowledge. (Hollis, 1994)

Secondly, observations are not simply immediate, ineffable perceptions. They have meaning only when they can be interpreted in the light of previous experience. This presupposes the pre-existence of an hypothesis. Of course, any hypothesis which directs observation also influences what factors are observed. Hence, hypotheses constrain meaningful experience. (Cohen and Nagel, 1934, p. 215-217)

Thirdly, as the rationalists indicated experience may be erroneous. Our senses are fallible. Different observers often see the same event in contradictory ways. Instruments exacerbate this problem further for while they can increase our ability to observe, they also constrict what we can see as well. (Cohen and Nagel, 1934, pp. 215-217)

Fourthly, in practice induction is not so easy to perform. Schön (1983) has suggested that induction obliges a process of directed observation which should be seen as a form of experimentation. He has used the term "exploratory" to distinguish this form of experiment from that used to test hypotheses. Having collected data, positivist usually employs statistical techniques to conduct exploratory studies of an issue in order to identify potential relationships between variables (Lee, Barua, and Whinston, 1997). Strauss and Glazer (1967) have also offered an approach known as Grounded Theory as a systematic means of guiding observation and assisting induction which is less quantitative. Eisenhardt (1989b) has even suggested how case studies might be used in a similar fashion. For a positivist propriety with which a researcher performs induction is the prime measure of rigour.

The tentative nature of induction causes problems as well. It requires positivists to spurn the idea of theories as representing necessary laws. Since induction results only in
probable knowledge, theories represent economical expressions of patterns of experience, not certain knowledge. They simply represent relations between variables. They are causal only in the sense that it allows the directions of the relations to be indicated. Moreover, since a theory may refer only to the objects of experience, this means that no metaphysical constructs may be introduced to explain the mechanism which underpins the theory. In other words theories deal only with what relationships exist, not why they exist. (Lee, Barua, and Whinston, 1997, p. 110). Concepts have no meaning beyond their role as dependent or independent variables in these equations. Positivists do not think it fitting to consider the underlying nature of reality as a rationalist does. They believe that metaphysics is not an appropriate subject for study since nothing worthwhile can be said about it. In short for positivists theories are much less rich and less certain affairs than for the rationalist. (Hollis, 1994) They do not provide explanation and their predictive value is only probabilistic.

The lack of richness in positivistic theories causes a particularly severe problem when dealing with social phenomena. The essence of social processes cannot be captured by looking at unidirectional cause-effect relationships (Weick, 1979). Instead reciprocally interacting causality should be examined to understand the individual’s views and roles. Understanding social reality requires insight into how practice and meanings are created and informed by values and norms shared by individuals working together. Positivism is not likely to produce such a depth of understanding (Lee, Barua, and Whinston, 1997, p. 115).

In particular IS researchers working within the positivist tradition examine the effects of one or more variables on another. Normally they will either portray information technology as the causal factor and users as passive or they look at users as acting rationally when using IT to achieve some specific results. Whatever the view, according to Kaplan and Duchon (1988), these analyses tend to treat organisational features, user features, technological features, and information needs as static, independent, and objective rather than as dynamic, interacting constructs. These can be evaluated independently and additively often ignoring the social and political issues. In a similar vein Kraemer and King (1990) have argued:
Supply-push views of technical developments, coupled with a rational economic interpretation of managerial behavior have dominated MIS (management information systems) research. These explanatory perspectives have considerable power, and have yielded useful results. However, they do not explain the variance observed in the patterns and processes of adoption and routinisation of information technology in various tasks, or the differences in successful use of the technology across organizations. (p. 582-583)

Strict positivism also deals somewhat differently with confirmation than rationalism. A positivist researcher is not attempting to confirm a theoretical model of a phenomenon. Instead, he is trying to demonstrate a statistical correlation between measurable variables. As Pinsonneault and Kraemer (1993) have written:

...[R]esearch aimed at explanation asks about the relationships between variables. It does so from theoretically grounded expectations about how and why the variables ought to be related. The theory includes an element of cause and effect in that it not only assumes that relations exist between the variables, but assumes directionality. (p. 80)

Confirmation in this case does not indicate that the proposed theory applied in each appropriate case, but only that the results were unlikely to occur by accident. Again, this means that confirmation depends on the employment of precise statistical methods which determine the rigour of confirmatory research.

This undercuts the important concepts of hypothesis testing, repeatability and refutability. This situation is particularly problematic when dealing with social processes. For example, Antill has noted that "the very act of installing an information system (changes) the situation into which it is installed. Therefore no particular 'experiment' can be repeated" (1984, p.282). Similarly, refutability is problematic when applied to research in the social sciences. Predictions are difficult in the social system as they may themselves have an effect on the outcome. Checkland (1981) has summarized Popper's view on this issue:

...the happenings in social systems are strongly influenced by the growth of human knowledge; the future growth of knowledge is in principle unpredictable.
since we cannot know the not-yet-known; therefore the future of social systems cannot be predictable. This means that we must reject the possibility of a theoretical history, that is to say, of a historical social science that would correspond to (e.g.) theoretical physics.... (p.283).

The doctrine of naturalism which claims that scientific methods are applicable to the social world cause problems beyond those of confirmation. Perhaps the most bitter criticism of positivism is that it declares that much of what is unique about that world (i.e. values) is unknowable. On this matter positivists agree with rationalists because they both adopt the stance of the realist, that there is a single, objective reality. Values are pluralistic and, therefore, subjective. Hence, Bleicher has noted:

The empirical-analytical method is the only valid approach to improve human knowledge. What can't be investigated using this approach, can't be investigated at all scientifically. Such research must be banned from the domain of science as "unresearchable". (1980, p.14)

Klein and Lyytinen have voiced their outrage at the arrogance of this point of view:

The danger of scienticism [i.e. positivism] when applied to the resolution of practical problems lies in a narrowing of problem perception to those aspects which are "researchable" by given scientific methods. What is not researchable is by definition not publishable and therefore not fundable. By a conceptual sleight all relevant practical problems on which good types of scientific evidence cannot be brought to bear ... are defined to be illegitimate as far as science is concerned. (1985,p. 139)

Orlikowski and Baroudi (1991) have argued that positivism is the most commonly adopted approach in information systems research. The truth of this assertion is unclear because positivism is such a catchall term. Kolakowski (1968) in his history of positivism has enumerated many varieties. Hollis (1994, p. 41) has noted the diversity of ways in which the term positivism is handled within the social sciences. He has written that most broadly "it embraces any approach which applies scientific method to human affairs conceived as belonging to a natural order open to objective inquiry". Clearly, this is too general to be in keeping with the strict interpretation of positivism rendered by
Kolakowski (1968) for it would allow the inclusion of rational as well as empirical approaches within its scope.

This confusion between positivism and rationalism also holds within the academic IS community. For example, Walsham has appraised much IS research as reflecting "a rational-economic interpretation of organizational processes and a positivist methodology which is based on the view that the world exhibits objective cause-effect relationships which can be discovered, at least partially, by structured observation". (1993, p. 4) Klein and Lyytinen have expressed a similar opinion of IS research.

At the core of scientism (i.e. positivism) is the notion that the so-called scientific method defines the only valid ideal of knowledge.... The empirical-analytical method of science evolved from a synthesis between formal methods of reasoning and empiricist methods of data collection. Experimental and observational data collection methods provide the inputs without which formalized theory is empty and the methods of formalized reasoning provide the guidance without which data collection is blind. (1985, p. 136)

Both of these opinions show an inclination towards Hollis' broad definition. Hence, in a precise sense positivism may not be as prevalent in IS research as some authors claim. Nevertheless, it forms a very important school of thought.

Lederer's and Sethi's paper "Root Causes of Strategic Information Systems Planning Implementation Problems," (1992) illustrates an exploratory study conducted within the positivist tradition. They surveyed 163 information systems planners using an instrument which asked planners to rate the severity of 49 different problems with strategic information systems planning. The authors compiled this list of problems from the academic literature on this subject. Using the exploratory factors analysis technique, they found that five constructs were sufficient to categorize the significant problems:

i. Organization problems which refer to factors associated with organizational strategy, structure, information needs, etc.
ii. Implementation problems which refer to factors associated with carrying out the recommendations of the plan

iii. Database problems which refer to factors associated with the data architecture

iv. Hardware problems which refer to factors associated with information technology planning

v. Cost problems which refer to factors associated with the time and expense of planning.

They concluded by proposing a causal model which relates these five concepts. It indicates that organizational problems, which exist at the start of the planning exercise, directly cause implementation problems and indirectly cause implementation problems because of their effects on database, hardware, and cost problems. Their proposed model also predicts that cost problems have the largest direct effect on implementation problems.

Baroudi’s, Olson’s, and Ives’ paper “An Empirical Study of the Impact of User Involvement on Systems Usage and Information Satisfaction” (1986) illustrates a confirmatory study conducted within the positivist tradition. The authors sought to test three different causal models of the relationships among user involvement, user information satisfaction, and system usage. The theories of participative decision making (Locke and Schweuger, 1979) provides the basis of the traditional model which states that user involvement increases both user information satisfaction and system usage. The work of Fishbein and Ajzen (1975) on attitudes and behaviors offers an alternative model which suggests that not only does user involvement increase both user information satisfaction and system usage, but system usage also increases user information satisfaction. Dissonance theory (Fishbein and Ajzen, 1975) forms the basis for a third possible model which again indicates that user involvement positively affects both user information satisfaction and system usage, but also that user information satisfaction increases systems usage.
In order to test these three models the authors created separate instruments for user involvement, user information satisfaction and system usage. They sent different sets of instruments to 200 U.S. production managers. They calculated path coefficients for each of the three models and tested them for statistical significance. As a result, they found the strongest evidence for the third model which indicates that user information satisfaction increases system usage.

While the studies of Lederer and Sethi (1992) and Baroudi et al. (1986) are academic, they have some bearing on information systems practice. Lederer's and Sethi's work warns an information systems planner that it is important to ensure that a planning exercise should consider organizational goals, structures, and needs. Moreover, their research indicates clearly that it is important that such studies are performed rapidly and inexpensively. Baroudi et al.'s study reinforces the conventional wisdom that user participation in systems development leads to higher satisfaction and increased usage. However, neither paper provides any concrete ideas for incorporating these insights into IS practice. Lederer and Sethi conclude that the most significant implication of their research is that strategic information systems planning (SISP) methods need to be more focused, but provide no advice into how this might be accomplished. Baroudi et al. provide even less resounding guidance concerning the implications of their research:

Information systems practitioners may consider this study as reasonably strong justification for actively involving users in system development activities. Until further research is conducted, however, practitioners will need to continue to rely on experience, intuition, and the prescriptive literature for guidance in determining the appropriate type and degree of user involvement required. (1986,p. 38)

Nevertheless, positivistic studies such as these promise to improve IS practice in the same way that clinical trials of drugs progress medical practice. By exploratory analysis of factors which may affect IS practice new causal models can be developed. Extensive clinical trials of these models may confirm their usefulness in practice.

While the rationalist is able to view information systems practice as a rational activity, it is less clear what a strictly positivistic approach to practice might be. One possible
illustration might be Carlson's paper "Business Information Analysis and Integration Technique (BIAIT) - The New Horizon." (1979) which describes a research agenda for identifying common information architectures for organizations. This proposal suggests that it is possible to categorise the information needs and structures of organizations by using a seven-dimension scheme. In a truly positivistic approach Carlson would have developed this scheme by means of induction. However, there is no evidence that this is how he discovered it. Unfortunately, Carlson did not carry out this project to a conclusion.

The so-called "uncommitted business model" is another version of this approach. King has defined the concept to be:

...a generic model of an enterprise that can be 'expressed' rapidly in order to create a new information system, or application, and that can grow over time to cover a large area of business activity, thereby providing a repository of business practice and know-how. (1998, p. 381).

Megaprogramming packages, such as SAP, have made this form of IS practice feasible. These packages embody "best practice" in some area of operations, such as manufacturing or supply chain management. They achieve this by using standard data models of the operational area. Because they are highly parameterized, they can be configured in a variety of different ways at the time of installation.

Again the idea which underlies this form of IS practice is positivistic. The development of the "uncommitted business model" arises from an empirical review of best practice in an industry or an operational area. Further study then identifies the small number of ways in which a model may be configured. Programmers then codify the data model and each of the means of maintaining it in software. The buyer can then tailor this megaprogramming package at the time of implementation to fit his needs.

The merit of this exercise rests on Jonsheer's observation cited in an earlier chapter:

[O]ne cannot help noticing how standardized are the informational activities carried out by diverse businesses. The number of billing clerks per accountant, of
secretaries per administrator, of telephones per officer worker — indeed, practically any measure of the pattern of expenditure on informational activities — appears to be stable across industries. There are a few different ways in which it [information] can be stored..., a few different ways in which it can be transmitted, and a few different ways in which it can be processed. (Jonscher, 1994, p. 16).

Clearly, this approach is highly empirical because it depends on a detailed observation of processes within an industry or a functional area in order to determine the "best practice". This procedure requires induction in order to identify patterns of information requirements which are common across organizations and industries. In this sense such approaches are positivistic rather than purely rationalistic.

The difficulties with this approach are obvious. Because software developed in this manner claims to be "best practice", it is likely not to represent any particular company's actual practice. In order to install standard software an organization will almost certainly have to change its business processes. This may not be advantageous. This approach to practice may be disastrous if the wrong standard is chosen. For instance, if the software assumes highly centralized management, but the firm which adopts it is very decentralized. Or if a make-to-order manufacturer selects software which supports mass production. In addition IS practice based on a positivist philosophy may result in a firm making a tacit decision that it will not try to use its information systems as a source of distinguishing itself from competitors. At an industrial level this can lead to lower levels of innovation.

5.2.3 Interpretivism

Like positivism, interpretivism is strongly empirical. In order to understand social phenomena an interpretivist must have a thorough knowledge of detail. However, the foundations of interpretivism rest on criticisms of positivism, particularly the doctrines of realism and naturalism.

Interpretivists do not believe that there is a single, objective reality which is knowable. Rather the world is socially constructed by means of communities of individuals creating shared meanings through interaction with one another. Consequently, our knowledge is
an interpretation and agreed understanding. It does not serve as an explanation. Hence, it is subjective or more properly intersubjective. As Walsham has written "... [interpretivist] theories of reality are ways of making sense of the world and shared meanings are a form of intersubjectivity rather than objectivity" (1993, p.5).

While arguing that there is no objective physical world seems counter-intuitive, this assertion makes more sense in the context of the social world. This artificial world is the creation of humans and arises from their activities which are influenced by their intentions. Each individual perceives and responds to the world in his own unique way. Therefore, there is the possibility of many different interpretations of social phenomena. Hence, there must be a plurality of interpretations, not a single one.

Moreover, researchers themselves are active in this process of creating reality and have their own particular standpoint or bias as do all others. Consequently, they cannot assume an independent role, but play a part in the phenomena under study. Researchers' interactions can affect the phenomena studied. This means that the concept of objectivity is aspirational. In practice it can not be achieved. Hence, the scientific method is not a suitable tool of examining social phenomena.

Interpretivist argues that positivism neglects aspects of cultural environment, social interaction and negotiation that could affect not only the outcome but also the conduct of a study. It produces studies which generate a deeper understanding of social processes than the sparse causal models of positivism. Patton (1990) has listed the advantages of the interpretive approach as greater attention to nuance, setting, interdependencies, complexities, idiosyncracies and context that such approaches give. Despite these strengths, interpretivist approaches have a number of drawbacks.

First, the term itself does not actually refer to a single account of method, but a family of loosely related theoretical stances. Walsham (1993) has included among speech act theory, phenomenology, hermeneutics, critical theory, soft systems methodology, structuration theory, and post-modernism. While these approaches are all subjectivist and critical of naturalism, they differ from one another in a variety of ways. For example, speech act theory view the fundamental components of society to be acts of communication between individuals who are free to act accordingly, while critical theory
makes the Marxist assumption that economic structure of society determines individual action. As a result of these differences, it is impossible to articulate one methodological approach to interpretivism. This results in fragmentation and competing schools within the paradigm. Hence, the question of relevance and rigour becomes even more daunting for an interpretivist researcher.

Secondly, scientists have developed techniques for controlling observations in order to insure against confusing confounding influences. This is difficult to do in a social setting because society is not a laboratory. It is not so easily controlled and a single case study commonly yields more variables than data points which renders statistical controls inapplicable. (Yin, 1981)

Thirdly, interpretive studies have often been criticised as being non-generalisable (Orlikowski and Baroudi, 1989). The positivist generalises observations from a population of instances by a careful procedure of induction in order to create causal relationships. Generalisation for the interpretivist concerns the extension from the micro-context to the totality that shaped it. Here, every particular social relation is the product of generative forces or mechanisms operating at a more global level. Hence, the interpretive analysis is an induction, guided within a theoretical framework, from the concrete situation to the social totality beyond the individual case. However, the mechanisms of induction are poorly and variously defined. In fact it might be argued that interpretations are simply the result of intellectual intuition, just as rationalist laws. However, interpretivist studies are usually less ambitious in that they are more likely to suggest concepts or frameworks which are less general.

Fourthly, because interpretivist studies usually produce concepts which are less general and which are rarely quantitative, they are not so susceptible to controlled deduction. As Lee has noted, research which "performs its deductions with verbal propositions ... deprives itself of the convenience of the rules of algebra; it does not deprive itself of the rules of formal logic." (Lee, 1989). Nevertheless, logical principles are difficult to master regardless of the language employed.

Fifthly, the lack of generality and the difficulty in producing deduction places a significant burden on the interpretivist in the matter of verification. This is particularly
true with respect to repeatability and falsifiability. Interpretivist research is unlikely to observe the same set of events occur in the same way twice. Each experiment is different. Consequently, it is difficult to articulate the result of an interpretivist study in a way which is capable of falsification. The chief riposte to this criticism is that interpretivist studies intend to increase understanding, not to provide explanation or prediction. Thus, the valuation of interpretivist study seems to depend strongly on depth of insight produced and the persuasiveness of the study.

Even though not the dominant paradigm, interpretive approaches have been used in a variety of ways in information systems research (Walsham, 1995; Symons, 1993). Walsham (1995) has argued that since human interpretations regarding computer-based information systems are central to the practice of IS and therefore to the studies done by IS researchers there is a need for much work from an interpretive approach.

Possibly, the best known interpretivist research is Zuboff’s (1988) of the effects of the introduction of computer technology into the operational control of paper mills and into the administration of financial service firms. Her technique is best described as a rich case study (Walsham, 1995). In it she identifies two concepts - automating and informating. She distinguishes between them in the following manner:

On the one hand, the [information] technology can be applied to automating operations according to a logic that hardly differs from that of the nineteenth-century machine system - replace the body with a technology that enables the same processes to be performed with more continuity and control. On the other hand, the same technology simultaneously generates information about the underlying productive and administrative processes through which an organization accomplishes its work. It provides a deeper level of transparency to activities that had been either partially or completely opaque. In this way information technology supersedes the traditional logic of automation. The word that I have coined to describes this unique capacity is informate. Activities, events, and objects are translated into and made visible by information when a technology informates as well as automates (Zuboff, 1988).

She develops these concepts by demonstrating why managers view automation as a tactic for increasing control over their workforce. However, she believes that they regard with
concern the strategy of informating. Even though informating offers a good many more benefits than automating it changes managers’ relationship towards workers because it allows for increasing decentralization. This undermines managers’ authority and status and requires them to adopt new attitudes and to learn new skills. Hence, she increases our understanding of organizational resistance to IT which is usually regarded as arising from the workforce, not from management.

Interpretivists have adopted a special method with regard to practice known as action research. Bryman defines this approach as:

An approach to applied social research in which the action researcher and a client collaborate in the development of a diagnosis of and solution for a problem, whereby the ensuing findings will contribute to the stock of knowledge in a particular empirical domain. (1989, p.178)

The idea of action research arises from the work of Lewin who believed that complex social events could not be studied in the laboratory, but required the researchers participation in the research setting. This means that a researcher does not remain an observer but becomes a participant within the study.

The best known example of action research within the IS community is Checkland’s work in creating the soft systems methodology (Checkland, 1981). Having realised that traditional engineering techniques were unable to deal with problems arising from social systems, he undertook a programme of developing an appropriate method for this situation. He did this by conducting projects using action research which required changes in the way which organizations processed information. This led to a gradual refinement of the concepts which underpinned the method as well as to the procedure itself. However, action research has had virtually no impact on information systems practice in general.

Action research suffers from the weaknesses of all interpretative approaches. However, it is a unique method and so, it has some unique problems. For example, Checkland (1981) points out that it can not be wholly planned or directed since the clients’ problems, not the researcher agenda, dictates what is to be done. This raises a serious problem which is
inherent in the ambiguity of the term "action research". Is it meant to be action or research? As Sandberg puts it:

[T]he problem in many action research projects is to develop a functioning interplay between action practice and ... scientific practice. A strong emphasis on the difference between an action practice and a scientific practice brings to light the weaknesses in the type of action research which, in too unproblematic way, tries to combine the two types of activity. (1984, p. 88).

The problem arises from the incompatible characteristics of research and of practice. Research has a long-term perspective. It requires access to information and often results in generalisation. It depends on open publication of results so that they may be debated widely in order to establish their merit. Practice is usually short-term. It sometimes requires suppression of information and publication. It demands answers and the development of local knowledge. Action research may raise ethical problems for a researcher because it may not be clear whether a satisfactory resolution of an organizational problem or knowledge in the form of deep understanding is the goal of the exercise.

5.2.4 Pragmatism

Pragmatism is a philosophy which is virtually unknown in the IS community. It is largely the product of three American philosophers Peirce, James, and Dewey. Peirce coined the word "pragmatism" to describe his own variant of positivism. However, it was James (1907) who applied the term to the set of philosophical doctrines which are now called pragmatic. Dewey (1916) shaped these ideas into a form which makes them particularly relevant to the understanding of practice.

At the heart of pragmatism is the belief that the measure of knowledge is neither explanation, nor prediction, nor understanding, but utility. James has claimed that theories were merely instruments for manipulating the everyday world. A pragmatist, according to James "turns away from abstraction and insufficiency, from verbal solutions, from bad a priori reasons, from fixed principles, closed systems, and pretended absolutes and origins. He turns towards concreteness and adequacy, towards facts, towards action." (1907, p. 51) Hence, pragmatism, like positivism and interpretivism, proposes that
knowledge arises out of experience, not reason. Yet, it does so in a radically different manner. Kolakowski has clarified this when he wrote:

...[P]ragmatism attempts to ground our thinking about the world on a concept of "experience," which supersedes all "substantialized" entities such as matter or spirit, and treats them as secondary distinctions made with the area of experience itself; it also seeks to do away with unanswerable questions. But whereas, according to the empiricocritics [i.e. a radical form of positivism], the possibility of applying a judgment effectively consisted in the fact that the judgment entitles us to certain expectations in the world of experience, and that it can be tested by the success or failure of our predictions - according to the pragmatists it is sufficient that we be able to "do" something with a given judgment, to be entitled to regard it as meaningful. (1968, p. 160)

In his book *Essays in Experimental Logic*, Dewey (1916) has explicated this idea. He has observed that everyone is constantly engaged in "nonreflective" experiences. The significant characteristic of these experiences is that they hang together because they are familiar as repetitions of previous experiences. He has called these "immediate" experience. These occasions are impoverished because they do not demand cognition. As Hickman has written:

...[they] do not require active responses so long as they remain unproblematic. They are simply undergone and enjoyed. They may have traits and elements that are isolable as the result of previous inquiries, but they themselves do not call for further inquiry. (1990, p. 21)

However, there are situations to which we cannot react reflexively. They are unexpected, incomplete, and problematic. We need reflection in order to resolve them. They are cognitive experiences. We do not just have to consider a problem in order to solve it, but also in order to find "something else to get a leverage for understanding it." (Dewey, 1916, p. 12.) This tool is not simply a means of resolving the problem. It is a means of reorganizing the experience so as to overcome its disparity, its incompatibility, and its inconsistency. (Hickman, 1990, p. 21). These tools may be material, but they are just as frequently conceptual, such as a theory, a concept, or a principle. It is not necessarily a solution because it must be tested first in order to determine whether it does
suffice. Dewey has said that "the manner in which we judge the appropriateness of our chosen tools is by means of their concrete and overt application to the specific problematic situations for which they have been chosen. They do not stand apart from a situation, but enter into it." (Hickman, 1990, p. 22).

Clearly, Dewey regards these cognitive experiences as crucial. He views our ability to control such situations as the definitive human skill. Thus, he considers there to be a direct connection between mankind as homo faber and as homo sapiens. The mechanism of control is reasoned inquiry. This is the process used in experimental science. This is why he refers to his interpretation of pragmatism as "experimentalism".

Schön's work on reflective practice is the most detailed examination of Dewey's experimentalism in practice (1991). He has observed a number of practitioners at work—architects, psychotherapists, commercial scientists, town planners, and managers. He has claimed that underpinning the action of each is a similar method which they use to deal with situations of uncertainty, instability, uniqueness and value-conflict. He has observed that practitioners often reveal a capacity for reflection in the midst of action and they use this capacity to cope with the unique situation of practice. Schön has described reflection-in-action as an epistemology of practice. This is essentially Dewey's notion of reasoned inquiry.

Schön has described practice in the following terms. A practitioner approaches each problem as a unique case. He frames the problem using some theory, concept, or idea derived from previous experience. These serve as instruments of investigation. When applied to a specific situation, they have logical implications and he must draw out the logical consequences of the instrument he has chosen for the situation. This task is a form of experiment to discover what follows from the way he has framed the problem. Schön has written

> In order to see what can be made to follow from his reframing of the situation, each practitioner tries to adapt the situation to the frame. This he does through a web of moves, discovered consequences, implications, appreciations, and further moves. Within the larger web, individual moves yield phenomena to be
understood, problems to be solved, or opportunities to be exploited. (1991, p.131).

However, this process also creates unintended changes which introduce new meaning into the situation. Schön has said that the situation “talks back” and a practitioner must always listen and appreciate what he hears. This is the essence of the experimentalism. He has concluded:

In this reflective conversation, the practitioner's effort to solve the reframed problem yields new discoveries which call for new reflection-in-action. The process spirals through stages of appreciation, action, and reappraisal. The unique and uncertain situation comes to be understood through the attempt to change it, and changed through the attempt to understand it. (1991, p. 132)

This twist to empiricism has a revolutionary effect on the idea of knowledge. For Dewey a tool which resolves a reasoned inquiry has a significance for a problem. In this sense it brings meaning to the situation. Again, Kolakowski has explained the view of meaning for pragmatists:

[A pragmatist] does not aim at merely formulating criteria for distinguishing meaningful statements from meaningless ones, and methods for determining the meaning of a statement; what he asserts is that the meaning of a statement is identical with its practical consequences, that these consequences are the meaning, not merely a means of arriving at it. (1968, p. 156)

Hence, Dewey has suggested that knowledge is created when a problem is settled by means of employing instruments, not only in its solution, but in its formulation as well. This understanding of knowledge is radically different from that of rationalism and empiricism. Hickman has explained how Dewey’s notion of knowledge differs from previous philosophers:

The world of our experiences is a real world, but a world that is in need of transformation in order to render it more coherent and more secure. Knowing an experienced world is instrumental to rearranging it and giving it form that is more useful to our purposes. But knowing in this sense is not something done apart
from the world; it takes place experimentally inside experienced situations. The
difference between knowing and other existential interactions is, in Dewey's
terms, "not between something going on within nature as a part of itself and
something else taking place outside of it, but it is that between a regulated course
of changes and an uncontrolled one. In knowledge, causes become means and
effects become consequences, and thereby things have meanings." (Hickman, 1990,p. 38)

Truth to a pragmatist is not an abstract mental idea. It is the outcome of an action that is
meant to confirm or negate a proposition. James has written that "True ideas are those that
we can assimilate, validate, corroborate and verify." (1907,p.201) In a world that is
continually changing, "truth itself becomes the result of change, a consequence of
experience and a product of human action" (Diggins, 1994,p.133). James has insisted that
"truth happens to an idea. It becomes true, is made true by events" (1907, p.201). Or as
Kolakowski has written:

...[For a pragmatist ] There is no such thing as truth viewed as abstract
conformity independent of human intervention between a given statement
and that to which the statement refers. Truth is nothing more but the
usefulness the statement has for our actions. (p. 156)

Dewey has also argued that absolute certainty is illusory. The belief in necessity is
superstitious. The construction of theories is just a special case of the resolution of any
practical problem. In his later writing he even abandoned the use of the term "truth".
Instead he spoke of "assertions" being "warranted" as a result of their utility in specific
cases. As Sandel has written:

At the heart of his [Dewey's] pragmatism was the notion that the truth of a
statement or belief depends on its usefulness in making sense of experience and
guiding action, not on its correspondence to an ultimate reality that exists outside
or beyond our experience. According to Dewey, philosophy should "surrender all
pretension to be particularly concerned with ultimate reality" and accept the
pragmatic notion that "no theory of Reality in general, Uberhaupt, is possible or
needed." (1996,p. 35)
Quine's understanding of truth is even more radical. He believes "true" knowledge to be a "web of belief" which is constantly changing. In his essay "Two Dogmas of Capitalism," he has claimed:

The totality of our so-called knowledge or beliefs, from the most causal matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges. Or, to change the figure, total science is like a field of force whose boundary conditions are experience. A conflict with experience at the periphery occasions readjustments in the interior of the field. Truth values have to be redistributed over some of our statements. Reevaluations of some statements entails reevaluation of others, because of their logical interconnections - the logical laws being in turn simply certain further statements of the system, certain further elements of the field. Having reevaluated one statement we must reevaluate some others, which may be statements of logically connected with the first or may be the statement of logical connection themselves. But the total field is so under-determined by its boundary conditions, experience, that there is much latitude of choice as to what statements to reevaluate in the light of any single contrary experience. No particular experiences are linked with any particular statements of the interior of the field, except indirectly through considerations of equilibrium affecting the field as a whole. (1943, section 6, paragraph 1)

In short pragmatism rejects the correspondence theory of truth. It replaces traditional theories of knowledge based on this premise with a theory of inquiry. It is not surprising that rationalists and empiricists criticise this position as being naive.

The implications of this position led James to subjectivism and relativism. A theory may be true or false depending on the context. One should not speak of truth without reference to a situation and to a person. James' position also suggests a strong individualism. To the extent that "true" ideas enable us to adapt to situations, and to the extent that they result in greater fulfillment and satisfaction, the pragmatist regards the true not only as the useful but also as the good (Diggins, 1994).

This means that:
Pragmatism renounces all prohibitions referring to the assertion of any conviction, so long as these prohibitions are motivated by logical considerations, by purely intellectual requirements, or by metaphysical doctrines. We are entitled to believe anything at all if believing it is advantageous to us or helps us to life. The “only reality” is success in life broadly. (Kolakowski, 1968, p. 157)

Dewey's position is more subtle. He was no more content with the idea of subjective, than he was with objective, knowledge. He understood inquiry as a social process and so viewed knowledge as intersubjective as do interpretationalist. Kolakowski has commented:

Dewey... was not so much interested in the conditions of individual success as in the improvement of public life and the prospects of political democracy, and for this reason his epistemology departs from James's pragmatism in one essential respect: he asserts the existence and supremacy of values that are not connected with individual success, but bind all men equally - in other words, the existence of a primary collective utility that can provide us with criteria for socially important choice.... Since questions about usefulness refer primarily to social usefulness, "truth" too, ceases to be a means to an individual end at a certain moment in a man's life, and becomes an instrument of social action; it remains relative as before, but relative to a broadly understood "collective interest" and hence preserving a permanence and intersubjective character that James's doctrine... could not ascribe. (1968, p. 163-164).

In his article "The Core of Dewey's Way of Thinking" Burtt (1960) has suggested that early in Dewey's career he concluded "all human action, including thinking as an important part of action, has consequences; and that the vital difference which men in general and philosophers especially are concerned about is whether responsibility for those consequences is accepted or not." This implies that cognitive experiences are inherently social. Since any solution to a problem will have consequences which may affect a number of people, a responsible individual must consider the effects of his decisions on others. Any resolution must be in the "collective interest". The best way to ensure this outcome is to view experimental inquiry as a social process. This process amounts to a conversation among a community in order to determine the instruments which frame and resolve a difficulty in the best manner for the whole. This is exactly
how science as a collective enterprise is suppose to work. Conjectures are made. Any
member of the community may test or criticize a conjecture. They may repeat tests. As
long as a conjecture is not falsified, it must continue to be considered. When it is
falsified, it can be altered and the process can begin again. Dewey's experimentalism is a
social activity and its result are intersubjective knowledge.

While Dewey's understanding of knowledge as socially constructed addresses the concern
that pragmatism is too ruthlessly individualistic, it does not confront the criticism that
pragmatism is exploitative or that it overemphasises control. This judgement on
pragmatism has arisen from several sources. The most vocal are Marxists philosophers,
for example the Critical Theorists, Habermas (Hickman, 1990, p. 161), Horkheimer
(1974) and Marcuse(1964), who imply that pragmatism is the philosophy of capitalism.
Another group of critics were the existentialist philosophers who were followers of
Heidigger(1977). A third opponent of pragmatism is Ellul who views technology as a
force which is out of the control of mankind(1964).

Hickman (1990) has argued that at the heart of these criticisms is a misunderstanding of
Dewey's pragmatism. The key to this misinterpretation is the assumption that Dewey
regarded all experience as cognitive. In fact he suggested that the vast majority of our
daily perception are immediate - affectational, aesthetic, social, and otherwise. Cognitive
experiences are rather rare, but significant. Dewey would not have entirely disagreed, for
instance, with Heidigger (1977) in saying that the world could be viewed in two opposite
ways: one directly and aesthetically; the other as a standing reserve to be exploited. He
would not, however, have agreed with the implications which Heidigger drew from this
distinction.

Unlike rationalism, empiricism, and interpretivism, pragmatism is fundamentally a
philosophy of practice rather than research. It proposes that practice is not so much
dependent on scientific theory, but rather research is a form of practice. It manufactures
tools which may be used by practitioners. For this reason research should arise from
practical problems, it is not prior to them. For the products of research, that is theories, to
be tested, they must be tried within the context of problematic situations.
The only major IS research which claims to have been conducted within the pragmatist spirit is the MARS projects. This project investigates how information systems development was actually carried out in practice (Lanzara and Mathiassen, 1985) and experimented with means of changing working practice. This project has resulted in the Professional Work Practice approach to software development.

The theoretical stance of these projects, however, is unclear in that they seem to draw from Heidegger's existentialism and depend on action research which are hallmarks of an interpretivist position. This means that they do not profit from the intersubjectivist perspective which Dewey gave to pragmatism. Therefore, the Professional Work Practice approach opens itself to complaints that it serves IS professionals interests rather than users (Ivari, Hirschheim, and Klein, 1998, p.184).

5.3 The Choice of Philosophy to Underpin this Research
If one agrees with Keen's assertion that the information systems community shares a belief that its research is purposive, then pragmatism seems the appropriate philosophy to adopt in this study. The rationalist, positivist, and interpretivist philosophies appear inadequate because they are concerned respectively with explaining, predicting, and understanding. The primary focus of this research is utility. It seeks to affirm that a proposed EIS benefits management method works in a specific context. Therefore, it attempts to transform problematic situations.

Appraising the utility of the method is the prime objective of this research. Generalizing the outcomes of experimentation in order to offer warrants for theories, concepts, or principles is a secondary objective.

As this chapter has explained, pragmatism emphasises action, practice, and a concern with what works. Method is a means for achieving certain ends, it is purposive. Accordingly, the proper test of correctness or appropriateness is the pragmatic questions: Does it work? Does it achieve its intended purposes? Rescher (1977,p.3) has written, "with particular regard to methodology at any rate, the pragmatists were surely right: there can be no better or more natural way of justifying a method than by establishing that it 'works' with respect to the specific appointed tasks that are in view for it". The important issue is the "pragmatic" one of assessing whether the method actually works in
practice, whether the results of using the method realise the purposes for which it was formulated. This is appropriately summed up by Rescher:

> the rational legitimization of a method is not at all a question of theoretical considerations turning on matters of abstract principle, but is essentially practical in its orientation. Its success in application, its capacity to do its intended work, in short, its usefulness, is the decisive consideration when the validation of a method is at issue. (1977, p.4)

For this reason this research will adopt a pragmatic view.

**5.4 Towards a Method of Pragmatic Research**

The case for selecting pragmatism rather than rationalism, positivism, or interpretivism as the philosophy for this study seems strong. However, this decision poses a severe problem. Because little IS research has been conducted within this paradigm, the dangers of this decision are obvious. First, it is clearly for the community of IS practitioners to judge the relevance of this study. However, since the study was conducted within the context of a Ph.D. program, IS researchers must also judge its relevance. The obvious difficulty which this should raise is the problem of satisfying two audiences, each of which has its own standards of rigour. In this case the dilemma is more severe since there is no community of IS researchers or practitioners who adopt pragmatism. Hence, there are no recognized standards of rigour within the IS community as a whole. This does not mean though that pragmatic practice and research is without precision. On the contrary, pragmatism proposes that practice should be imbued with an exactness similar to that inherent in experimental sciences. The standards of rigour adopted by pragmatism needs to be made explicit if the results of the study are to be persuasive to members of the IS community who are likely to be familiar with other philosophies.

There are four activities which must be undertaken in a study guided by pragmatism. First, the tools employed in the study must be selected or created. Secondly, the experiment must be conducted. Thirdly, the outcomes of the experiment must be evaluated. Finally, an experiment may indicate the need for amending the knowledge which it employed. This indicates that learning has occurred as a result of the
experiment. Schön has recommended criteria for assessing the rigour of each of these
four steps.

5.4.1 Tools

One important issue for a pragmatist is how to make use of previous experience in the
context of the current problem? In other words how do we come up with the propositions
or the hypotheses to start the current inquiry? The professionals in Schön's cases drew up
their hypotheses based on there past experiences. Under positivism, the hypotheses may
emerge from earlier scientific work (Cuba and Lincoln, 1989). In Methodological
Pragmatism, Rescher (1977) put forward the idea of inquiry as an input-output process.
He proposed the use of presumptions as input to the inquiry. These presumptions are
plausible postulations, they are not established as true, but are backed by an expectation
that they may turn out as true if all goes well. These presumptions are validated by the
results of the inquiry. The inquiry process incorporates a feedback loop which reassess
the appropriateness of these initial, tentative, merely plausible presumptions. This cyclic
process of revalidation will gradually enhances the status of these presumptive theses or
on the other hand they can be dismissed as false.

Another way of considering this issue is to imagine the random selection of a tool to solve
a problem. It is unlikely that an effective tool will be identified initially using this
procedure. However, the practitioner can not know this until he has exhausted the logical
implications of the tool. If he then repeats the random selection of a tool without taking
into consideration anything he has learned during his first attempt, he may never solve his
problem. Therefore, a practitioner needs to have some warrant for believing that the tool
he has chosen will be effective in the problem that he wishes to solve. This increases his
assurance that he will be able to alter a situation in the desired manner in a finite time.

Obviously, one form of assurance is the practitioner's previous experience. If he has used
the tool before in apparently similar circumstances, he will have some reason to believe
that it will be useful again. However, if the experience seems novel to him, he will have
to employ a tool with which he is unfamiliar. In these situations a tool which is founded
in previous experience will serve as the next best thing. If it depends on or is coherent
with theories, concepts, and principles which he already knows, it will be even more
persuasive.
Of course, a further test of the appropriateness of a tool is whether it increases a practitioner’s understanding of a problem. Does it result in an interpretation which is infused with new meanings. Clearly, it must also frame the problem in such a way that it is capable of being solved and that it promotes a response from the situation. If it is incapable of creating a conversation which can be convergent, a tool can not be useful. As Schôn has indicated, a tool must “keep the inquiry moving”.

Dewey’s experimental form of pragmatism accepts the term “conversation” in a literal rather than the figurative sense used by Schôn. A practitioner does not have a metaphorical conversation with a problematic situation which can “talk back”. Because EIS are social as well as technical artifacts, the conversation is among those who are interested in the systems - executives and support personnel as well as developers.

5.4.2 Experiments

Obviously, experiments are at the heart of experimental pragmatism. To Schôn, experiment in practice is different from experiment in research. He has defined experiment as "any deliberate action undertaken with an end in mind" (1991, p.146). He has described three types of experiments: hypothesis testing, exploratory, and move testing. Hypothesis testing is important to rationalist and positivist alike. It is an activity by which a researcher confirms or refutes a hypothesis. A hypothesis is confirmed if its predicted results fit with what is observed. Otherwise it is refuted. Positivist depend on exploratory experiments which are carried out to see what happens. There are no accompanying predictions or expectations that need to be compared. Schôn has described this type of experiment as "the probing, playful activity by which we get a feel for things. It succeeds when it leads to the discovery of something there" (p.145).

Schôn has defined move testing experiments as:

Any deliberate action undertaken with an end in mind is, in a sense, an experiment. In the simplest case, where there are no unintended outcomes and one either gets the intended consequences or does not, I shall say that the move is affirmed when it produces what is intended for it and is negated when it does not. In more complicated cases, however, moves produce effects beyond those intended. One can get very good things without intending them, and very bad
things may accompany the achievement of the intended results. Here the test of affirmation of a move is not only Do you get what you intended? but Do you like what you get? (1991,p. 146.)

Dewey's experimentalism is one of move testing, not just hypothesis testing or exploration. It deals in affirmation and negation, not in truth and falsifiability.

In fact within an experimental method the same action may be interpreted in all three ways. In trying to transform a situation, the experimenter undertakes a sequence of moves. This is a move testing experiment. At the same time these moves also function as exploratory probes, stimulating feedback from the situation which may lead to other ideas and new perceptions. It is also hypothesis testing as the experiment starts with a hypothesis and attempts to confirm or to falsify it.

However, there are several differences between hypothesis testing in practice and the method of controlled experiment advocated by Dewey. Schön has observed that the greatest difference is that the practitioner makes his hypothesis come true. His hypothesis testing may involve moves that change the phenomena to make the hypothesis fit. The important difference between the practice and the research context has to do with the relationship between changing things and understanding them. The practitioner is interested in changing the situation from what it is to something he likes better. His interest in understanding is to help him in realising the change, not to explain the "true" workings of natural or artificial phenomena.

Hence, the practitioner's hypothesis testing consists of moves that change the phenomena to make the hypothesis fit. Schön has written "The inquirer's relation to this situation is transactional. He shapes the situation, but in conversation with it, so that his own models and appreciations are also shaped by the situation" (1983,p.151).

Rationalists and positivist will object to this interpretation of experimental method. The literature on organizational experimentation proposes a hierarchy of approaches which vary in degree of rigour: (Rossi and Freeman, 1993). They are:

i. Randomised experiments
Randomised experiments involve comparisons between groups of targets, randomly assigned either to experience some intervention or to be left 'untreated'. According to Rossi and Freeman, the randomised controlled experiment is the strongest research design for assessing the results of interventions. It is a very effective way to rule out the possibility that something other than the programmatic change is causing any effects that have been observed (Weiss, 1972). However, there are some limitations. First, it is only applicable to partial coverage programs, that is programs which either are to be tested on a trial basis or are reaching only a relatively small proportion of the members of their intended population. Secondly, these experiments are expensive and consume a lot of time. Thirdly, the success of these experiments depends very much on the target and stakeholder cooperation.

Like randomised experiments, quasi-experimental impact assessments are commonly used whenever there is partial program coverage. The difference is that under the quasi-experimental regime it is not possible to randomise targets into groups that participate and do not participate in the program. The comparison and experimental groups are not equivalent. The extent to which the comparison groups differ from the experimental groups must be assessed and the groups adjusted to equate them.

Reflexive controls are alternative experiments for full-coverage programs. With full-coverage programs, there are no untreated targets which can be used as control group. The targets serve as their own control.

Shadow control is at the bottom of the evaluation hierarchy. It is applicable for full-coverage programs and is an option to reflexive control. The evaluation depends on judgements of experts, program administrators and participants of the shadow control. It is cheap and is a traditional means of evaluation. It is normally used to indicate a rough estimate of the program impact. The data for the evaluation come from these sources:

i. administrative records
ii. observations of project operation
iii. interviews with participants
iv. interviews with stakeholders and informants on the project's context.

This study will adopt shadow control as the research design in the experiments for the proposed EIS benefits management method. Even though it is the least rigorous of the four approaches, it is the most appropriate. First, shadow control is designed for full-coverage programs. The EIS in this study are accessible by every executive in the organisation. There can, therefore, be no untreated targets. Secondly, the study requires only an indication of whether the experiments are giving positive impact. Exact measures are not needed. Shadow control experiments are sufficient for this. Thirdly, there is limited time for the conduct of the study. This too favours shadow control. Rossi and Freeman have written:

> Although some theorists in the field emphasise the scientific aspects of evaluation and others its ad-hoc qualities, a pragmatic view sees evaluation as necessarily rooted in scientific methodology but responsive to resource constraints, to the needs and purposes of stakeholders, and to the nature of evaluation setting (1993, p.55).

This study does adopt a pragmatic view and this requires primarily evidence that the method produces satisfactory outcomes. Moreover, the time, money, and personnel to conduct these experiments is necessarily limited. Shadow control experiments seem, therefore, to provide an appropriate degree of rigour at an acceptable cost.

5.4.3 Outcomes

Pragmatists hold experiments should be evaluated primarily on their outcomes. In particular Schön has suggested that the chief criteria for affirming a method is to ask:

i. Has one gotten what one intended?

ii. Does one like what one got?

Every experiment will produce some change in a situation. Table 5.1 lists the four possible results of any change.
Has One Gotten What One Intended? | Does One Like What One Got?
---|---
1. No Surprise | Desirable or Neutral
2. Surprise | Desirable or Neutral
3. Surprise | Undesirable
4. No Surprise | Undesirable

Table 5.1: Possible Results of an Experiment


In the first case the practitioner has achieved what one has intended without getting any unwanted consequences. In this situation the experiment has been affirmed and the problem solved. In the second case one has achieved a desirable outcome even though it is not what was intended. In this situation the experiment has also been affirmed because finding a suitable solution is the prime measure of success. In the third case the experiment has failed. It has not produced the intended result and its consequences are undesirable. This means that the experiment is negated and the theory, concepts, or principles employed are not useful in this situation. This should trigger the practitioner to criticize the theory in order to reformulate it. Then he can conduct the experiment again. This process should continue until the experiment succeeds or until the modified theory offers no more insight into the problem. In the latter case the practitioner must adopt a new instrument if he is to succeed. This scenario should eventually work. In the fourth case the experiment has failed even though the outcome is the expected one. He would need to consider these possibilities carefully in order to alter the assumptions which underpin the theories. Then he should perform the experiment again using the revised or new theories. This does not directly result in revised knowledge, but may lead to it.

Any pragmatic method should provide means for dealing with each of these four eventualities.
5.4.4 Organisational Learning

Schön has argued that the process of reflective practice which he describes is common to
good practitioners in all professions. He has said "[f]aced with some phenomenon that
he [a practitioner] finds unique, the inquirer nevertheless draws on some element of his
familiar repertoire which he treats as exemplar or as a generative metaphor for the new
phenomenon." (1991, p. 268). Reflective practice, therefore, is a constant interplay
between individual situations and generalized elements. He has claimed that these
patterns consist of:

i. media, language, and repertoires
ii. Appreciative systems
iii. Overarching theories, concepts, and principles
iv. Roles

While every practice employs its own unique frameworks, the process of applying them is
similar.

He has noted that there is a tendency to regard these elements as constant because they
change so slowly. However, he has argued that this view is the single greatest limitation
to reflective practice or experimentalism. The ability to adjust these generalized elements
as a result of the outcome of experiments is critical to ensure that a method may be
developed.

Each of the four scenarios enumerated in Table 5.1 identifies an experimental procedure
for solving problems. In Argyris' (1977) terms these procedures lead to single loop
learning. However, each also offers an opportunity for organizational learning. In
Argyris' terms this corresponds to double loop learning. While solving problems is the
responsibility of the practitioner, creating and maintaining organizational knowledge is
the responsibility of the researcher. In this study the research acts both as practitioner
and as researcher.

In the first case the outcome of the experiment is intended and it is desirable. Moreover,
a rationalist or positivist would say that it had also not been falsified. A pragmatist
would claim that the experiment provides a warrant for assuming that any theories,
concepts or principles which have been employed are generalisable. The experiment, therefore, should increase confidence in existing knowledge.

In the second case the outcome is unexpected even though it is desirable. A rationalist or a positivist would say that any theories, concepts, or principles employed in the experiment had been refuted. A pragmatist would claim simply that the tools of the inquiry were negated. A practitioner has no further need to investigate the failure of these instruments, but a researcher does need to consider the reasons why the theories which he used did not produce the expected result. This should result in a refinement of knowledge.

In the third case the outcome is both unexpected and undesirable. A rationalist or a positivist would say that any initial theories, concepts, or principles employed in the experiment had been refuted, but that any revised theories which had been successfully deployed had not been falsified. A pragmatist would view the initial tools of the inquiry to be negated, but would claim that the revised tools were affirmed. However, it would be difficult to generalize the revised theory since there is only a single instance of its affirmation. The experiment, therefore, questions existing knowledge while proposing alternatives which have been little tested.

In the fourth case the outcome is expected, but has undesirable consequences. In this situation a rationalist or a positivist would insist that the theories, concepts, or principles employed in the experiment had not been falsified. However, the pragmatist would take an entirely different view. The most likely reason for this is that the theories, concepts, or principles used may be too simplistic. There are probably more complex forces at work than the instruments employed assume. Another possibility is that the scope of the theories are limited. Again, it would be difficult to generalize the revised theory.

Any pragmatic method which supports double-loop learning should incorporate a means of amending knowledge as the results of experimentation.
The Proposed Research Method for this Study

The final question which remains to be discussed in this chapter is how the general requirements of a pragmatic method can be tailored to this study.

5.5.1 The Proposed Method as a Controlled Inquiry

Interpreting the proposed EIS Benefits Management Method in the light of Schön's explanation of reflective practice, helps to clarify this issue. Each project is an experiment. Each experiment has three phases. The first is to select the tools to use in conducting the experiment. This phase corresponds to the Benefits Identification stage of the method. The second is to frame the experiment. This phase corresponds to the Planning Benefits Realization stage of the method. The third is to execute the experiment. This phase corresponds to the Executing Benefits Realization Plan stage of the method. This pattern constitutes a controlled inquiry.

In addition the proposed method begins by creating a framework for experimentation. It identifies all potential experiments. If an organization has any existing EIS, then this step requires conducting a baseline study to enumerate them. If the organization has no existing EIS, then this step requires the identification of a set of potential systems. This phase corresponds to the Create Baseline stage of the method. Next, the method requires a means of selecting experiments which are to be performed. This phase corresponds to the Select Project stage of the method.

Finally, the proposed method has a mechanism to incorporate organizational learning. This phase corresponds to the Project Evaluation stage of the method.

Figures 5.1 and 5.2 relabels the stages of the method in order to align its terminology with Dewey's pragmatic experimentalism which is the philosophy underpinning this study.
FIGURE 5.1: Modified Process Model For Benefits Management

FIGURE 5.2: Perform Experiment
5.5.2  Affirming the Method

The method as a whole can be seen in two lights. First, it provides the backdrop for all experiments. Secondly, it can be regarded as an on-going experiment itself. Like individual experiments, testing it must be done at two levels. First, it must be shown to produce the intended outcome without having any undesirable consequences. However, the method also is a complex tool which is intended to solve the problem of managing EIS benefits. Each time it is successfully employed the method is affirmed as an instrument. However, it may sometimes be negated. In these cases there needs to be an examination of what has gone wrong. This should lead to modifications which reflect organizational learning. Hence, in order to affirm the method it needs to be tested in as many situations as is possible. However, it must also demonstrate that it can evolve in order to reflect changes in the theories, concepts, and techniques which underpin it.

5.5.2.1 Affirming the Identification of Experiments

There are two tools used in this step. The first assists organizations which already have a portfolio of EIS. The tool adapted to do this was the technique which Belcher and Watson (1993) developed to create a baseline for EIS in Conoco. The second assists organizations which have no EIS in creating a portfolio of possible projects. SISP methods may be used. There are four categories by which each of these tools should be evaluated.

The first is whether there is a warrant for using these tools. Since the research has no experience of using either, the question must be what are their origins. Do they derive from experience? What theories, concepts, or principles are they founded on? Do they bring meaning and coherence to the problem? Do they lead to a solution? Do they encourage a convergent conversation?

The second refers to the conduct of the experiments. The prime questions are do the tools lead both to the expected and the desired solutions. The adoption of experimentation using shadow controls implies that the answers depend on the judgements of the experts, programme administrators and participants who make up the community of individuals who are effected by these experiments.
The third refers to the outcomes of the experiment. Do the tools used to identify the list of potential experiments deal with breakdowns in the conversation?

The fourth refers to organizational learning arising from an experiment. The important issue here is to test the mechanism used for altering either of these tools as a result of knowledge gained by using them.

5.5.2.2 Affirming the Selection of Experiments
This step could employ many tools. One might select experiments which lead to new EIS or improvements in old. One might select experiments which affect EIS which are legally required or which have the greatest potential benefits. In this study the experiments will be selected using two principles. First, experiments will be selected to maximize the aspects of the method which are tested. Secondly, experiments must be feasible to conduct within the constraints of this study. This two criteria will serve as the basis for evaluating this step although it should be recognized that this situation is exceptional.

5.5.2.3 Affirming the Experiments
This step actually employs three interconnected tools all of which are frameworks of:

i. Theories of Executive Work
ii. Benefits Models
iii. Benefits Realization Models

The framework of theories of executive work serves as an instrument for selecting the benefits model which should be used to frame the problem of benefits management for a particular EIS experiment. The benefits model in turn dictates which benefits realization model needs to be employed to guide the experiment. Each of these three frameworks and their component tools must be evaluated in terms of the four categories discussed earlier in the chapter.

The first are there warrants for using these tools. Do they derive from experience? What theories, concepts, or principles are they founded on? Do they bring meaning and coherence to the problem? Do they lead to a solution? Do they encourage a convergent
conversation? Secondly, do they lead both to the expected and the desired solutions. Again, using shadow controls as a means of evaluating experiments requires that evaluation of participants in the experiments. Thirdly, do the tools deal with breakdowns in the conversation? Fourthly, do the mechanism used for altering these tools as in light of knowledge gained by using them work?

5.6 Summary
This chapter began with Keen's (1991) assertion that both the determination of the relevance and the rigour required of a piece of research depends on the audience to which it is addressed. This observation points to a fundamental problem with IS research. The IS community can not only be divided into practitioners and researchers; it may also be categorized on the basis of, at least, four philosophies - rationalism, positivism, interpretivism, and pragmatism.

This study adopts pragmatism, specifically Dewey's (1916) version known as experimentalism, as its philosophical stance. This is because pragmatism is primarily a philosophy of practice. It judges actions on the basis of whether they were undertaken in a controlled manner and whether they succeed. It does not claim to create true explanations and predictions of natural and artificial phenomena as does rationalism. It does not claim to create probabilistic predictions as does positivism. It does claim to increase understanding as does interpretivist investigations, only pragmatism sees this as a byproduct of inquiry rather than its raison d'être.

A major problem with the use of pragmatism in this study seems to be that few IS practitioners have used it. While Schön (1991) offers a clear description of the standards of rigour for pragmatic studies, there are few in the IS community who will recognize these standards. Therefore, this chapter identifies the four major areas where standards exist - tools, experiments, outcomes, and learning - and it explores the standards for each area.

Finally, the chapter describes the EIS Benefits Management Method proposed in Chapter 4 in terms of Dewey's pragmatism. This makes clear the central role which experimentation plays in the method. Each EIS project is an experiment. The method begins by identifying all potential experiments and then selecting one to perform. Each experiment
consists of four steps: select a tool; frame the experiment; conduct the experiment, evaluate the experiment.

The next chapter describes the implementation of the study which was conducted based on this philosophical approach. Experiments were conducted in several public organisations in Malaysia in an effort to affirm the utility of the proposed EIS benefits management method.
CHAPTER 6:

CONDUCT OF STUDY

6.1 Introduction
This research consists of three field studies within several public organisations in Malaysia. The first was a study of executive work. It examined the daily activities of executives. The objective was to validate the categorisation of executive work proposed in Chapter 2. The second was a baseline study of EIS use. Both studies took place for twelve weeks, from 4th March to 29th May 1997. The third tested the proposed benefits management (BM) method. It began in June 1998 and is ongoing. It analysed existing EIS applications and experiments.

6.2 Executive work study
The study of executive work required two stages. The first stage was a pilot study done at the University of Surrey. The second occurred in three public organisations in Malaysia: the Selangor State Government; the Ministry of Agriculture; the Prime Minister’s Office. All three organisations had EIS. The researcher knew the executives in the State Government and Ministry of Agriculture. As for the P.M.’s Office, the researcher has been one of the staff since 1985.

The empirical evidence regarding the nature of executive work suggested Mintzberg’s (1973) categories were the most comprehensive. In addition several researchers have replicated his work and reached similar conclusions. Therefore, the approach that Mintzberg adopted in conducting his research seemed an appropriate means of verifying the relevance of the taxonomy of executive work.

The study tried to mirror the work done by Mintzberg as closely as possible. However, observing the executives directly in their offices was not possible. Observation had to be indirect, that is the researcher sat outside of the office in order to record the activities. Diary studies and interviews with the secretaries and other supporting personnel complemented the observations. In all three cases the executives’ secretaries helped to
build a more complete picture of the activities that took place. The researcher also interviewed as many of the people who met with the executives as possible. Following Mintzberg, the preliminary data collected prior to the observation included: the executives' previous appointments for the past one month taken from their diaries; information about the organisations such as structure charts; their objectives and functions; information about the executives (from publications as well as through a profile database). All these aided the researcher's understanding of these executives and their responsibilities. The past one-month diary entries indicated whether the one-week activities were typical. The organisation chart and information on objectives and functions gave insight into the executives' responsibilities and provided an understanding of the executives' environment. Descriptions of the executives gave a detailed account of their personal background, experiences, and interests. These gave the researcher a deeper appreciation of the men.

The data recording method was Mintzberg's. There were three types of records: the chronological, the contact, and the mail. The chronological records were recorded on pre-prepared daily observation forms. They noted times and basic activities designed to provide data concerning the working day. They showed, at a glance, the distribution of the different activities. The details recorded were:

i. activity
ii. time start
iii. time finish

Unlike Mintzberg who categorised the activities at this stage into meetings (scheduled and unscheduled), deskwork, telephone call, and tour, this study recorded the activities without categorising them. The researcher opted for this so that information about these activities would help her in categorising the executives' roles in the contact record. The researcher also recorded the starting and finishing time for each activity. This differed from Mintzberg who recorded only the start time and put in the duration for each of the activities. The researcher found it easier and more systematic to record both times and to calculate the duration later. The activity record was begun each day by filling in each
activity from the diary. Then observation led to the completion of time and duration. For events that took place away from the office, officers who accompanied the executives cooperated. However, when this was not possible, the diary provided the actual timing. The chronological records led to more detailed contact records.

The contact record described each verbal contact. These could be in the form of telephone calls, scheduled and unscheduled meetings, functions and ceremonies, tours and other activities where the executives came into contact with others.

There were several differences from Mintzberg in the recording of the contact record in this study. Mintzberg had coded basic information of each contact activity such as the medium of contact (call, meeting, etc), purpose, participants, initiator, duration and place. The researcher, however, had included two more items to the contact record and changed the type of information recorded under two of the items. The reason was that Mintzberg used the contact records as one of his information sources in producing the managerial work categories. The researcher, on the other hand, tried to use this categorisation to describe the roles of the executives in each of their contact activities.

The two additional items are influence type and role type. There are two categories of influence, informational influence and normative influence. The researcher based this categorisation on Clapper and McLean (1991) who have viewed group-work from an influence processing perspective. Clapper and McLean have based their categorisation on Deutsch and Gerard (1955) who have defined normative influence as "an influence to conform with the positive expectations of another" and informational influence as "an influence to accept information obtained from another as evidence about reality". The basic premise underlying informational influence is that the ideas themselves are the influencing factor not the originator of the ideas. On the other hand, normative influence arises from the status of the originator of the ideas. Informational influence varies with the level of knowledge an individual has on the subject (Patel and Gordon, 1959). The more knowledgeable he is, the less susceptible he is to informational influence. Normative influence varies with the relationship an individual has with the source of the idea (Deutsch and Gerard, 1955). Higher authority exercises more normative influence.
The information on influence type should give a better understanding of executive work and it should help the researcher in determining the role type of each activity.

For the role type, the researcher followed Mintzberg's ten categories of executive work. The researcher analysed each activity based on the information she gathered and assigned it to the most appropriate role.

The two items that the researcher has defined differently from Mintzberg were, medium and participant. Mintzberg has defined medium more as activities such as telephone call, meeting, and tour. The researcher, on the other hand, defined medium as the information channel or the media by which the interaction took place. These may be telephone, face-to-face or written documents. These should provide information on how the executives acquire information.

Mintzberg has recorded under participant, the actual person involved in the contact activity. They may be the manufacturing manager, controller, etc. The researcher has instead defined participant in terms of their relationship to the executives. The participant may be a superior, a subordinate, or a peer (Adam and Murphy, 1995). In the study of the PM, it was thought to be more meaningful for the participants to be classified as executive, legislative, partisan, citizens, and those from abroad (Neustadt, 1960). To have this type of information should assist the researcher in determining the role type for each activity.

Taking all these items, the details recorded under the contact record were:

i. activity
ii. purpose
iii. initiator
iv. participant
v. medium
vi. influence type
vii. role type
Contact activities cover all scheduled and unscheduled meetings, telephone calls, briefings, ceremonial duties, visits and tours. The purpose of the activity indicates reasons for it being undertaken. Initiator describes the party which provided the stimulus for the contact, the executive or the other party.

The researcher completed most contact records at the time of observation with the help of the secretary and other relevant officers. Most of it was straightforward. However, categorising the role sometimes needed further background work. Determining whether the influence was informational or normative also posed a problem. Without talking to the participants after the activities, assumptions had to be made based on the status of the participants. The knowledge of the secretary and other support personnel was often helpful in these matters.

The mail records detailed the nature of the correspondence received and generated by the executive. Mintzberg recorded the response as each piece of mail was received. Did the executive read or just skimmed through it? In this study, without direct observation, the researcher assumed that the executives read all the mails. This was reasonable as all correspondence went through a senior officer who filtered them. Hence, the executives received only relevant mails. Details recorded under the mail record were:

i. form of mail
ii. purpose
iii. subject
iv. sender (incoming mails) or recipient (outgoing mails)

Incoming and outgoing mails required separate forms. Mails took the form of letters, reports, minutes, and publications. Following Mintzberg, the purpose of a letter was either for requests or for information. Status requests are those made to the executive due to his position, for example asking him to give a speech. Authority requests are those
made to the executive because he has the power to decide. Information covers all mails that provide some information to the executive. These are general reports, project proposals, ideas, events, reports on operation, problems and reference data. Subject is the topic of the mail and sender is the person or organisations sending the mail.

6.2.1 Pilot study - University of Surrey

The researcher conducted a pilot study by observing the activities of a senior lecturer in the Department of Computing. It occurred from 10 to 12 February 1997. The purpose of the pilot was two-fold. First, the full study was to observe very top executives. It was important to get the data collection right, the first time. It would be very difficult to get access to them again. A pilot study would reveal some possible problems that might arise. Corrective measures could then be taken in the actual study. Secondly a pilot could familiarise the researcher with the recording of the results. This was significant because the researcher has made some modifications to the Mintzberg’s methods.

The researcher recorded the daily activities of the lecturer by using his diary, obtained through the secretary. To supplement this, the researcher obtained records of the daily activities from the respondent. This helped in revealing the unscheduled activities. The researcher recorded all these daily activities onto the chronological record form. For the contact and mail records, she obtained additional information such as incoming and outgoing mails and agenda of meetings through the secretary. With the information the researcher recorded the contact and the mail record forms. During the three days, there was no outgoing mail, hence there was no outgoing mail record.

At the end of the three days the researcher interviewed the senior lecturer in order to complete the forms. She checked the chronological records with those kept by the respondent. She then checked the contact records where she verified the assignment of influence and role types for each of the contact activity.

The researcher then had further discussions with the respondent to look into the problems that arose and the possible lessons that could be learnt before the full study. Assigning the
influence and role types were the source of most problems. The researcher found that unless the purpose and the background of a meeting was known and background information of the participants was available, it would be difficult to categorise the role of the executive and the type of influence he has. Unless the secretary is able to provide the necessary information, a detailed interview would have to be arranged with the executive.

After the pilot study, the researcher modified the contact record form to include the purpose of activity and initiator so as to have a more detailed picture. The information would also helped to determine the influence and role types.

6.2.2. State Government

The executive observed in the state government was the State Secretary, the most senior civil servant in the state. He is responsible for all the government departments at the state level and all state agencies which include the state development corporation, and all business joint ventures where the state is the majority shareholder. Above him is the Chief Minister. Being a federal officer he is also answerable to the Chief Secretary to the government. The State Secretary also has a unique function. He is responsible for all programs and activities of the Sultan (state's ruler).

Prior to the study, the researcher met with the State Secretary to explain the background and objective of the study. He granted permission to observe his work activities for a week. The observation period was from the 24th of March to the 29th of March, 1997. The researcher sat daily in the secretary's office throughout the week recording the activities and filling in the contact forms. Sitting in the secretary's room gave the researcher opportunities to meet and to talk with the various people who met the State Secretary. During the observation period, there were nine activities that took place away from the office. In four of the activities the accompanying officials confirmed the details. For the remaining five, the executive's diary provided the details. Although there were times when the executive was away for a few hours, the researcher used the opportunity to gain background information on past and future activities listed in his diary. The researcher did this by talking to the secretary and reading through relevant documents.
Every afternoon, the researcher had access to all non-confidential letters received for the day and copies of letters sent out. The researcher read all these letters and coded the items into mail records. The secretary provided necessary details of confidential letters.

The researcher interviewed the State Secretary a week after the observation period. He had to cancel an earlier appointment because of other urgent matters. The interview lasted for twenty minutes during which the executive clarified his role in palace activities and his relationship with the politicians in the state.

Appendix 2.1 shows the chronological and contact records of the State Secretary.

6.2.3 Agriculture Ministry

The secretary general of the Agriculture Ministry was the subject of the second study. The secretary general is the most senior public officer in the ministry and is answerable to the Agriculture Minister and the Deputy Agriculture Minister. He has two deputy secretary-generals. The researcher had a brief appointment with him to explain the objective of the research and obtain his permission to be observed.

The one-week observation period began on 8 April to 15 April, 1997. With the cooperation of his secretary, the researcher sat in the secretary’s office for most of the time the secretary-general was in his office. However, there were times when this could not be done. Nevertheless, cooperation from the secretary in noting down the events as they occurred into the chronological record and explaining them later did not affect the results. There were several occasions on which the researcher was able to observe the activities directly. One was when the secretary-general came out to discuss his programs for the day with the secretary. Another was an unscheduled meeting with his deputy who was in the secretary’s room at the time.

The researcher interviewed the secretary-general after the observation period. The interview lasted for more than fifty minutes. The interview also asked questions on the use of the EIS. The secretary-general explained the issues discussed with the minister and
gave a lengthy description of the conference that he had attended during the observation week.

Appendix 2.2 shows the chronological and contact records of the Secretary-General.

6.2.4 Prime Minister’s Office

The executive chosen for the study in this office was the Prime Minister himself. The observation period was also a week starting from the 21st of April to 26th of April 1997.

Each day, the researcher indirectly observed the P.M. except one day when the P.M. was away visiting a state. The electronic diary kept by his secretary provided records of his activities. It also offered the basic chronological record: the name of visitors for the day, the purpose of their visits and time of visits. Similarly the researcher recorded information on scheduled meetings, visits, receptions and ceremonial functions. Observation gave the actual time and duration of events and revealed other unscheduled activities that took place. These included unscheduled meetings with specific ministers or officers and telephone calls that the P.M. made or received. For the one-week observation, there were 21 activities that took place away from the office. Supporting officers who were present at events provided details of all activities that took place away from the office. The researcher recorded all of these in the chronological record. Unlike the two previous executives, the researcher was able to record P.M.’s evening activities. His house assistants recorded the information on his evening work.

The researcher spoke with the secretary during lunch breaks and after office hours in the evening. In total the discussions lasted for an average of 45 minutes per day. The secretary provided documents pertaining to meetings and discussions during the day for further understanding. For most of the scheduled activities, the secretary furnished the information. She gave backgrounds of visitors who came for the day, circumstances for the meeting such as who initiated it and for what reason. However, the secretary did not know the background for many of the unscheduled activities. In these cases, the Assistant Principal Private Secretary provided the details. These allowed the contact form to be completed. The researcher had fewer opportunities to talk with the people who came to
see the P.M. than with the previous two executives. She only spoke to two of the visitors.

Daily in the evening, the researcher had access to the mail received for the day and copies of mail sent out. The researcher read these in the presence of the secretary. The researcher could not take any mail away. She could not read letters marked 'secret'. For the observation period there were five such letters. The secretary provided brief details of these letters.

The researcher had an interview with the P.M. asking him about his work in general and his views and utilisation of the office computer system. The researcher taped the interview which lasted for 35 minutes.

Appendix 2.3 shows the chronological and contact records of the P.M.

6.3 EIS Baseline Study

The study to establish an EIS baseline in these three organisations occurred in the same period as the executive work study. The objectives of this study were:

i. To identify all existing EIS applications
ii. To determine the extent of use of each application
iii. To evaluate user satisfaction with each application
iv. To enumerate the benefits of each application

The researcher adapted her approach to this study from Belcher's and Watson's (1993) similar project in Conoco. The researcher and her supervisor decided that it was unnecessary to conduct a pilot study since there was to be little deviation from the original work at Conoco and moreover, there was no equivalent site for the study. Utilising the Conoco study did raise several issues. Conoco is a private, profit making organisation, while this study was on government organisations. Basic objectives and policies are different. Conoco is an American company based in an advanced and well-developed economy. The government organisations in this study are in Malaysia, a
developing country. There are clearly cultural differences between them. However, there were several reasons that these differences did not matter. First, the baseline study was an evaluation of EIS in the organisations. In Conoco, it was also an evaluation project. Second, both studies looked into the whole portfolio of projects. Third, the objectives of the project in Conoco were to identify: the users of the system; user requirements; low-value applications; applications that should be enhanced or added; a cost benefit analysis. These mapped nicely with the objectives of the baseline study. Fourth, the methods used in the Conoco project were not dependent on any unique organisational characteristics. Organisational and cultural factors did not seem to play very major roles here. Hence, the researcher could employ the methods of data gathering in the Conoco project for her baseline study with few modifications.

The major sources of information in the baseline study were interviews, systems' documentation and utilisation data. There were three groups of interviews in each organisation. First were the interviews with the EIS executive users. The interviews were in a semi-structured manner. There was a list of questions for the executives but the researcher encouraged discussions providing additional relevant information, comments, and opinions. The main objective of these interviews was to learn about executives' use of EIS and their perceived benefits of it. The interview questions came largely from the Conoco study. The changes made included:

i. deletion of two questions which were irrelevant to the organisations (these questions were specific to Conoco);

ii. addition of four new questions - one was considered preliminary to the interview, another question dealt specifically with benefits from the EIS applications, another question on whether EIS have change the way executives work, and another was on improvements to the EIS.

For the preliminary question, the researcher felt that it was good to start the interview by asking the executives about their usage of the EIS. The question on benefits of the EIS was important as it would make the executives state explicitly the benefits they perceived.
from the EIS. The researcher included question on EIS improvements in the hope that it would help to identify the present failings of their EIS.

A few more changes were made to the questions after validating them with three local IS personnel. These changes were:

i. deletion of one question;
ii. replacing one specific question with one which is more general.

The deletion occurred because one question was redundant. The new question on the EIS benefits made the question on productivity advantage which was in the original questionnaire redundant. The original questionnaire had asked about features on data handling procedures. It was thought that it was better to ask about EIS features in general.

The questionnaires are in appendix 3.1 to 3.3. The researcher adapted these questions further for her interview with the P.M.

The second set of interviews were with the IS support group and the executives' supporting personnel. These interviews gave further information on the use of EIS by the executives. Executives sometimes requested the EIS information through the support group. The interviews were semi-structured with some questions validating the information given by the executives. The researcher prepared these questions during the study period. This second set of interviews was conducted as the support group was in charge of promoting the EIS use.

The third set of interviews was with the EIS development group. The development group differs from the support group in that the former is responsible for developing and maintaining the EIS applications. The support group is responsible for promoting the EIS and training the users and in some cases helped to retrieve information for users. The objective of these interviews was to get information about each of the EIS applications.
These interviews asked details of each application. The interviews helped to complete the information and to clarify the data obtained from the various documentations.

For the project in Conoco, the researchers were able to gather the required information through interviewing key EIS users (e.g. department heads, users of critical data, frequent users). In this study, the researcher needed to interview the support group as the group has valuable knowledge on the use of EIS by executives. The development group, on the other hand, had detailed knowledge of each EIS application. Hence, the necessity to have the three-tiered interview structure.

In addition to the interviews, the researcher studied the documentation on each of the applications. Among the information gathered was the objectives, the functions and features and the software used.

The Conoco study started their valuation of the EIS by looking at the usage statistics. The state government and the Agriculture Ministry did not document any utilisation figures. The researcher could only estimate these figures by means of information gathered in the interviews. The application reviews done for each application in these two organisations thus did not show the frequency of access.

Besides the formal interviews there were numerous informal discussions on the use and benefits of the EIS applications in these three organisations.

6.3.1 State Government

The initial contact with the IS Unit in the state government was in the form of briefing by the Assistant Director of the Unit. The briefing ended with a demonstration of the applications. The researcher had access to the Unit's documentation room and she spent several hours on subsequent visits looking through the documentation. The documentation gave details of all the applications. The IS unit had developed several major databases. From these databases the unit had extracted some information and developed the EIS applications. Since the effort was quite recent (mid-1996), there were few applications developed.
To gather the extent of use, the researcher conducted several interviews with three different groups within the organisation. These were the executive users, the support group and the development group.

With the executive users the researcher had interviews with:

i. the State Secretary which lasted approximately for forty-five minutes.
ii. the State Financial Officer lasting approximately one hour.

There were seven senior officers meeting the definition of executives used in this dissertation within the organisation. The first two were the Chief Minister and his deputy. Next were the State Secretary, the State Financial Officer, the two Deputy State Secretaries, and the state Legal Adviser. The Chief Minister is a user of the EIS but he was away throughout the study period. His deputy is not a user of the EIS applications. The two deputies to the state secretary have not used the EIS even though they have the facilities. The researcher was unable to interview the legal adviser because of his busy schedule. Taking the total executive population, the researcher only managed to interview 29% of them. This however increased to 50% if only users of the EIS were considered.

These interviews used the earlier validated interview questions.

Among the support personnel, the researcher had:

i. an interview with the special officer to the State Secretary. The interview lasted for approximately fifty minutes during which the special officer described the nature of information which was normally requested by the State Secretary and highlighted the problems with the EIS.

ii. two interviews with the secretary to the State Secretary lasting approximately thirty minutes each.
The researcher interviewed the secretary who handled much of the State Secretary's activities. The secretary had suggested the interview with the special officer as he was responsible for much of the State Secretary's information requirement.

The researcher also had a number of unstructured interviews with members of the EIS development group, concerning details of the EIS applications. These were:

i. a series of interviews with the Assistant Director (a statistician) who is the informal leader of the group. The interviews gave insights into the usage of the applications, the problems and future plans of the Unit.

ii. a series of interviews with three other members of the group who are all systems analysts. The interviews gave details of the EIS.

iii. a short interview of about twenty minutes with the EIS manager. The interview highlighted the popular applications.

Using the information gathered through the interviews, documentation studies and many informal discussions, the researcher prepared review form for each application.

Appendix 4.1 shows the applications review.

6.3.2 Ministry of Agriculture

The study in the Ministry of Agriculture started with a meeting with the IS manager. It was a long meeting which lasted for nearly two and a half hours. The meeting highlighted the background of the IS Unit and the events leading to the development of the EIS. A brief demonstration of the available applications followed. The Ministry assigned a senior analyst as the reference point for this study.

As in the state government, the researcher conducted several interviews with the executive users, the support group, and the EIS development group.
With the executive users, the researcher held a series of interviews with:

i. the Secretary-General which lasted for thirty minutes.

ii. the Deputy Secretary-General lasting for more than an hour. The interviewee talked extensively about the benefits of the electronic mail.

There are five senior officers meeting the definition of executives within this research in the Ministry. They are the Minister, the Deputy Minister, the Secretary-General and two Deputy Secretary-Generals. The researcher only interviewed two of the executives. Attempts to interview the Minister and his deputy were not successful. Both had very busy schedules as Parliament was also in session during the period. The researcher decided not to interview the other deputy Secretary-General as he had just been transferred to the Ministry and had yet to use the EIS.

The interview questions were the same questionnaire used in the state government.

For the support group, the researcher held interviews with:

i. the secretary to the Secretary-General. The 40 minutes interview indicated that the Secretary-General is a very active user of the EIS.

ii. an interview with a systems analyst responsible for user training. The interview lasted for approximately an hour and a half. Substantial information on user feedback was obtained through the interview.

The researcher also held interviews with the IS development group. These were:

i. with the senior systems analyst who gave detailed accounts of the applications and problems of utilisation;
ii. with two systems analysts who filled in some of the missing gaps in the information collected.

The documents studied included: systems documentation of the applications; summaries of each application; the EIS user lists (access to the EIS was also given to other middle managers); a report of user feedback; the problem log.

From the information gathered, the researcher prepared application reviews for each of the EIS application in the Ministry.

Appendix 4.2 shows the applications review.

6.3.3 Prime Minister’s Office

Since the researcher had previously worked in the IS unit with this office, she needed no briefing. However, a meeting with the Unit Director highlighted the developments that had taken place during her absence. Compared to the other two organisations, the PM’s office has a very well developed EIS with a more extensive set of applications. All executives and middle level managers in the office have access to the EIS. The researcher followed the technique developed in Conoco more precisely in this case. First, the researcher collected the EIS usage statistics. The statistics were for a five year period, 1993 to 1997. They included the frequency:

i. of EIS use by each user by month;
ii. of use of each EIS application;
iii. of use of each EIS application by user.

The statistics gave information on which application were used and who was using each application. At the same time, the P.M.’s Deputy Principal Private Secretary made arrangements for an interview with the P.M. The researcher gave samples of the interview questions to the IS Unit Director. Three senior analysts then tried out the questions. The Deputy Principal Private Secretary received the questions for further refinement. She made several corrections, particularly to terminology. The changes included:
i. Replacing the term EIS with computer information system. The PM had always refer to the EIS as just computer information system.

ii. Questions regarding the PM's views on computerisation in general were added. This acted as preliminaries to begin the interview.

iii. Three questions were deleted. One question was on whether he has extracted information from the data bases. The PM was thought not to be able to understand it. Furthermore the answer can be obtained through the support group. The second question was on the role of EIS as the office's information transmitter to others and the third question was on whether the EIS can be the vehicle for the office's future applications. It was thought that all these would be covered under his views on computerisation.

The researcher then gave the questions to the Principal Private Secretary for submission to the P.M. prior to the interview. The researcher conducted the interview with the P.M. near the end of the study.

The researcher held other interviews with:

i. the Principal Private Secretary to the PM which lasted for one hour;

ii. the Deputy Principal Private Secretary to the PM. Being a former director of the IS Unit, the interview took approximately two and a half hours;

iii. the special officer to the PM which lasted for forty minutes;

iv. the press officer lasting approximately one hour;

v. two special function officers which lasted for thirty minutes and twenty-five minutes respectively.
These interviewees were support officers to the PM and were users themselves as well. They received two questionnaires - one on the EIS use and another on their supporting roles.

For the specific support group, the researcher had interviews with:

i. the librarian which took approximately one hour;

ii. the secretary which lasted for thirty minutes (The interview was only for clarification as informal discussions pertaining to the PM’s use of the EIS had been done frequently);

iii. the user support manager which took approximately one and a half hours;

iv. the operations manager which took approximately forty-five minutes.

There were numerous discussions and interviews with other IS personnel. These interviews were unstructured and sometimes took the form of informal discussions. These included a series of discussions with:

i. the director of the IS Unit;

ii. the programmer responsible for documenting the usage statistics;

iii. all three systems analysts in the office automation group;

iv. a systems analyst from the operations section (he is frequently asked to design ad hoc applications);

v. two systems analysts in the development section.

Finally the researcher prepared reviews of each EIS application. These gave details of each EIS application. Important information gathered from the review is the purpose of
the application and its tangible and intangible benefits. The application reviews helped substantially in categorising the benefits of each EIS application.

Appendix 4.3 shows the reviews for applications in the P.M.'s office.

6.4 Affirming the EIS Benefits Management Method
The purpose of this study was to affirm the proposed EIS benefits management method in practice. Initially, the researcher intended to include all three organisations in this study. However, during planning of the study, it became apparent that a very detailed understanding of the characteristics of the various EIS users and also of the organisations was necessary. This would require a considerable amount of time. But time was a major constraint for the researcher. Within the available time, it was only feasible to use one organisation. The researcher selected the PM's office because of her experience with this organisation and because of the office's extensive use of EIS.

The baseline study has revealed that there were a total of 33 EIS applications in the office. Mapping these applications to the six categories of executive work described in Chapter 2, nearly 70% of the applications were under the learning category. The rest were distributed under satisficing, sensemaking and persuading. To choose the applications for the affirmation, the researcher decided on the following strategies:

i. select application from different categories;

ii. select applications from different phases of development;

iii. select similar applications which were viewed differently.

Taking applications from the different categories would help to affirm the different benefits realisation models of the proposed benefits management method. Applications from different phases would affirm the applicability of the method throughout the process. Selecting applications from the same category but viewed differently i.e. one is considered more beneficial than the other would help to explain the success factors for applications in the category.
With these criteria as guidelines and after discussions with the IS Director and the EIS Support Manager, the researcher selected some applications. The researcher finally chose the Quran, BERNAMA news-online service, the external trade, the decision tracking and the electronic meeting applications.

The Quran application is a persuading application. It is categorised as such since it is mainly used to increase the influence and persuasive power of its users. The P.M. who is the main user of the application, uses it to maintain his credibility and reputation among the Muslims inside and outside the country. The application could affirm the causal factors for persuasion. Moreover, there are few persuasion applications in EIS literature.

The BERNAMA news-online is a learning application. Users scan the application reading through news and events that are happening around them. They scan through the system without looking for any specific information. Since users have found it beneficial, it could affirm the causal factors for learning.

Similarly, the external trade application is also a learning application. It is used more as a reference for trade matters. The researcher chose the external trade system as an example of an application that has not realised its stated benefits.

Decision tracking and electronic meeting applications were two newly proposed applications. They were categorised as sensemaking applications. The decision tracking application was initially thought to be a commanding application. However after some discussions with the Office Automation Manager and examining the proposal paper for the application it is clear that the application is not to monitor decisions but for executives to discuss among themselves on certain issues before making any decision. The application will have information about past government decisions and will also input information regarding issues which require decisions to be taken. Executives will have access to the system to discuss these issues, giving their input and getting feedback from other executives in the group. The electronic meeting is an application using videoconferencing facilities for users to have interactive meetings. The researcher
selected these two applications to affirm the utility of the benefits management method at the justification phase.

There were two phases to the affirmation of the benefits management method. The first was to study the beneficial applications and explain the successful use, and the second was to take a less successful system and set up experiments to effect beneficial changes. The first phase affirmation of the method would give some indications as to the appropriateness of the benefits realisation factors and formed a strong basis for the experiments in the second phase.

Since the idea of EIS benefits management is new to the office, the researcher spent much of her affirmation work briefing staff of the IS unit on the proposed benefits management method. She explained the proposed EIS benefits management method, describing the process and the concepts employed. Terminology such as sensemaking, bargaining, commanding and persuading were foreign to the group.

The Quran application
Since the application is categorised as the persuading application, the researcher applied the persuasion model in the experiment. The researcher tested each of the three category of factors proposed in the model. For user differences the researcher looked at the P.M. She based much of the information on the P.M. from the knowledge and experience she had working in the P.M.’s office and also through the latter’s writings and other publications written about him. The P.M.’s speeches, articles and books reflected much of his thoughts and interests while his characters were highlighted in many articles and books. To confirm, the researcher also spoke to the PM’s secretary, his special officer, the press officer, the librarian, and the Deputy Principal Private Secretary to the P.M. All of these officers had long association and frequent contacts with the P.M. With regard to organisational factors, the researcher again relied on her previous experience working in the office. To validate, she spoke to the IS Director and the EIS support manager. She also spoke to the Deputy Principal Private Secretary who handles all administrative matters of the office. The researcher studied the Quran application in detail determining whether it has the features proposed in the model i.e. in terms of differentiation and
integration of information and flexibility. She scanned through every screen and tried out all available functions. She spoke to the user support manager and studied feedback reports of the applications.

The BERNAMA news-online

For the BERNAMA news-online the researcher mapped the learning realisation model to the application. The baseline study provided basic details of the application such as its regular users and the benefits that were realised. The researcher once again applied much of her personal experiences working and socialising with the users to describe on the user characteristics. She also spoke to the executives’ respective secretaries, subordinates and other officers to enhance and confirm the knowledge. The officers the researcher spoke to were one Assistant Director and the Deputy Principal Private Secretary. The information the researcher gathered from these informal conversations confirmed most of her earlier observations. For the organisational factors, besides her own experience, the researcher had discussions with the EIS Support Manager and the Deputy Principal Private Secretary. In affirming the system’s features, the researcher studied the system thoroughly, went through all the screens and linkages besides getting feedback from the Principal Private Secretary, the special officer and the Press Secretary.

The External Trade application

The earlier baseline study had shown that the application had not achieved its intended benefits. The researcher then mapped the realisation model for learning to the external trade application. From the application review form of the application, the researcher noted the users of the system. She spoke to the user support manager to get the application’s target users. To confirm her previous observation on the lack of use of the system, the researcher spoke to the IS Director and the EIS support manager. She went through feedback reports of the system and spoke to two of the target users. The two target users were the Special Officer to the P.M. and the P.M.’s Press Secretary. The two cited reasons for their non-usage of the application. The researcher also spent time scanning through the external trade application, noting down its features.
To bring about beneficial changes to the external trade application, the researcher decided to try out several changes based on the benefits realisation model for learning. The researcher managed to get agreement from both the Deputy Principal Private Secretary and the IS Director for the experiments. Agreement from the Deputy Principal Private Secretary was necessary as she decides on all administrative matters. The IS Director had overall jurisdiction of the EIS systems and would be responsible for any changes made to the systems. The IS director assigned two officers to be responsible in carrying out the initiatives. The User Support Manager is responsible for all moves that involved promotion and user support. The Development Manager is responsible for all actions that affect changes to the systems. The researcher spent time with the two managers explaining the planned moves. It was agreed that some of the changes could be implemented immediately and some would have to be postponed to a later period. The researcher had made clear to the IS director and the two managers as to the approach. She emphasised that the actions to be taken might not be the right moves and changes might have to be made. The researcher participated in an experiment to promote the application to the executives. She conducted personal training in the application for the Special Officer. Some of the other changes are now ongoing and a few have yet to be implemented. The researcher only proposed changes under organisational and system features. There was nothing very much she could do in the short term to effect changes in user characteristics.

**Decision Tracking and Electronic meeting applications**

In affirming the applicability of the benefits management method at the different phases, the researcher studied the proposed decision tracking and electronic meeting applications. Both were to be developed under Office Automation. She studied the applications proposed reports and spoke to the Office Automation Manager. The researcher conducted a meeting with the Office Automation group. Also present at the meeting was the IS Director. The group had stated the objectives of the two applications but had not defined any potential benefits. The researcher explained how the generic benefits from the benefits model underlying the proposed method could overcome this problem. Much time was spent on discussing which management category would be best served by the two applications.
6.5 Summary

This chapter explains the activities that were undertaken in the process of affirming the benefits management method proposed in Chapter 4. The researcher had spent nearly seventeen weeks conducting the two phases of the field study. Much information was gathered through interviews, structured observation, diary and documentation studies, statistical data, and formal and informal discussions. The next chapter will examine the findings from these activities.
CHAPTER 7:

RESEARCH FINDINGS

7.1 Introduction
This chapter brings together all the findings from the three phases of the study. It presents the results of the executive work study on three executives. It looks into the findings of the EIS baseline studies on three public organisations. It then discusses five selected applications as case studies used in affirming the EIS benefits management method.

7.2 Results of executive work study
The first section of the chapter presents the findings of the replication of Mintzberg's (1973) study of executive work using three subjects: the State Secretary, the Secretary General, and the Prime Minister. The objective is to affirm the utility of the framework based on Mintzberg's work for the Malaysian government.

7.2.1 State Secretary
7.2.1.1 Chronological record
Table 7.1 presents the results of the analysis of the chronology records of the State Secretary. The State Secretary spent a total of 47.65 hours working in the observed period undertaking 72 activities. These activities were categorised under seven different types. These are deskwork, telephone call, scheduled meeting, unscheduled meeting, ceremonial duty, briefing, and observational tour.

On the average, the State Secretary engaged in 3 deskwork sessions a day. These sessions consumed 11.96% of his time. During these periods the State Secretary worked alone or sometimes with his secretary. Much of it involved the processing of mail, which averaged about 34 items a day. It was also during these deskwork sessions that the State Secretary accessed the EIS. The State Secretary spent very little time on the telephone. For the whole week, telephone calls amounted to less than half an hour. The State Secretary spent more than half of his working hours on meetings. There were a total of 39
meetings, 17 were scheduled and 22 were unscheduled. Even though there were more unscheduled meetings, these meetings only consumed 7.59% of his working hours. On the other hand, scheduled meetings amounted to 47.35% of the time. As an administrative head of the state, the State Secretary also serves the needs of the state ruler. He is responsible for most of the ceremonies that involved the ruler. During the observation week, the State Secretary spent nearly 18% of his time on the ceremonies. The rest of his time was spent on attending briefing and taking observational tours. The State Secretary attended one briefing which consumed an hour of his time. He undertook 3 observational tours, which amounted to 12.36% of the time.

41% of all activities observed averaged a duration of 10 minutes or less and only 24% of the activities lasted longer than 60 minutes.

**TABLE 7.1: Analysis of the chronological record of the State Secretary**

<table>
<thead>
<tr>
<th>Category</th>
<th>Total hours worked</th>
<th>Hours in travel to outside event (not included)</th>
<th>Total amount of mail</th>
<th>Total number of activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Desk work</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of sessions</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time on desk-work (hours)</td>
<td>5.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average duration of desk-work (hours)</td>
<td>0.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of time</td>
<td>11.96%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Telephone calls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of calls</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time on Telephone (hours)</td>
<td>0.43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of time</td>
<td>0.90%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Scheduled meetings**

<p>| Number of meetings | 17 |
| Time in meetings (hours) | 22.56 |
| Average duration (hours) | 1.33 |
| Proportion of time | 47.35% |</p>
<table>
<thead>
<tr>
<th>Unscheduled meetings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of meetings</td>
<td>22</td>
</tr>
<tr>
<td>Time in meetings (hours)</td>
<td>3.65</td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td>0.17</td>
</tr>
<tr>
<td>Proportion of time</td>
<td>7.66%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ceremonial duty</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of ceremonies</td>
<td>6</td>
</tr>
<tr>
<td>Time spent on attending ceremonies (hours)</td>
<td>8.42</td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td>1.4</td>
</tr>
<tr>
<td>Proportion of time</td>
<td>17.67%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Briefing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of briefings</td>
<td>1</td>
</tr>
<tr>
<td>Time spent attending briefings (hours)</td>
<td>1</td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td>1</td>
</tr>
<tr>
<td>Proportion of time</td>
<td>2.10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of tours</td>
<td>3</td>
</tr>
<tr>
<td>Time spent (hours)</td>
<td>5.89</td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td>1.96</td>
</tr>
<tr>
<td>Proportion of time</td>
<td>12.36%</td>
</tr>
</tbody>
</table>

7.2.1.2 Contact record

Table 7.2 contains the results of the analysis of the 57 contact records of the State Secretary. In the table, data are recorded in two ways, by frequency and by proportion of time. For example, scheduled meetings accounted for 29.82% of all contacts and 53.78% of all time in verbal contact. The figures are broken down in terms of activity, source of contact, medium, influence type and role type.

The State Secretary’s days were characterised by a large number of brief, informal two-person contacts (unscheduled meetings and telephone calls). Even though the two contact activities made up more than 50% of all contact activities, these accounted for less than 10% of all contact time. Scheduled meetings and ceremonial duties consumed more than 70% of the State Secretary’s contact time. Subordinates within the organisation took up about half the State Secretary’s contact time and were involved in nearly two-thirds of the contacts. Other contacts were distributed among the State Secretary's superior, representatives from other organisations, his peers and a small
number of subordinates from other government organisations. Almost all of the State Secretary contact with his superior was with the state ruler. These contacts accounted for nearly one third of the contact time. The State Secretary had very little contact with his own peers. All the contacts with his peers were through telephones. However, telephone as a medium formed only 14% of the contacts. The State Secretary's contacts were mainly face-to-face. The State Secretary had a relatively greater normative influence. This indicates that his position as the State Secretary is an important factor in influencing those around him. The researcher had categorised about 5% of the contacts as having both informational and normative influence as both influences were strongly felt in these activities. The researcher had used the purpose category in the contact records in order to determine the role type of each contact activity. However, there were activities which had required the assignment of multiple roles. An executive may be receiving information in a meeting, but in the same meeting he may be giving his subordinates information which he has gathered earlier. In this example his roles are both as a monitor and a disseminator. Hence the percentages for role type information in Table 7.2 are more than a hundred percent. The State Secretary had shown a slightly more informational role compared to interpersonal roles. However, in terms of time spent, the informational roles accounted for twice the time spent on interpersonal roles. The reason was that most of the informational roles were associated more with the long scheduled meetings while the interpersonal roles were associated with the numerous brief informal meetings. Among the three categories of interpersonal roles, the State Secretary's role as a leader was the most frequent. The State Secretary had frequent unscheduled meetings with his subordinates who came to seek his advice and opinion as the executive head of the organisation. His role as figurehead was mainly due to his involvements with the state ruler. As the State Secretary he had to be present during the numerous ceremonies at the palace. His liaison role came mostly from his association with private organisations. For the informational roles, the monitoring role was clearly the most frequent and consumed the most time. Most of these monitoring roles were through scheduled meetings. The State Secretary had very limited decisional contacts. His most frequent decisional role was that of a resource allocator. The next was entrepreneurial and disturbance handler came third. During the observation week the State Secretary was not involved in any negotiation role.
TABLE 7.2: Analysis of the contact record of the State Secretary

<table>
<thead>
<tr>
<th>Category</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time in verbal contact (hours)</td>
<td>41.95</td>
<td></td>
</tr>
<tr>
<td>Total number of verbal contacts</td>
<td>57</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity: Percent of contacts/Percent of time</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled meetings</td>
<td>29.82 / 53.78</td>
<td></td>
</tr>
<tr>
<td>Unscheduled meetings</td>
<td>38.60 / 8.70</td>
<td></td>
</tr>
<tr>
<td>Telephone calls</td>
<td>14.04 / 1.03</td>
<td></td>
</tr>
<tr>
<td>Ceremonial duties</td>
<td>10.53 / 20.07</td>
<td></td>
</tr>
<tr>
<td>Briefing</td>
<td>1.75 / 2.38</td>
<td></td>
</tr>
<tr>
<td>Tours</td>
<td>5.26 / 14.04</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source: Percent of contacts /Percent of time</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior</td>
<td>14.04 / 31.61</td>
<td></td>
</tr>
<tr>
<td>Subordinate</td>
<td>59.65 / 49.75</td>
<td></td>
</tr>
<tr>
<td>Subordinate from another department</td>
<td>5.26 / 2.10</td>
<td></td>
</tr>
<tr>
<td>peer</td>
<td>8.77 / 2.57</td>
<td></td>
</tr>
<tr>
<td>outside organisation</td>
<td>12.28 / 13.97</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medium*: Percent of contacts /Percent of time</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>85.96 / 98.97</td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td>14.04 / 1.03</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Influence Type: Percent of contacts/Percent of time</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Informational</td>
<td>43.86 / 55.26</td>
<td></td>
</tr>
<tr>
<td>Normative</td>
<td>50.88 / 36.21</td>
<td></td>
</tr>
<tr>
<td>Informational/normative</td>
<td>5.26 / 8.53</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role Type: Percent of contacts /Percent of time</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Figurehead</td>
<td>15.79 / 23.29</td>
<td></td>
</tr>
<tr>
<td>Leader</td>
<td>31.58 / 16.85</td>
<td></td>
</tr>
<tr>
<td>Liaison</td>
<td>12.28 / 4.84</td>
<td></td>
</tr>
<tr>
<td>(Interpersonal)</td>
<td>59.65 / 44.98</td>
<td></td>
</tr>
<tr>
<td>Monitor</td>
<td>36.84 / 50.92</td>
<td></td>
</tr>
<tr>
<td>Disseminator</td>
<td>14.04 / 27.15</td>
<td></td>
</tr>
<tr>
<td>Spokesman</td>
<td>10.53 / 12.37</td>
<td></td>
</tr>
<tr>
<td>(Informational)</td>
<td>61.41 / 90.44</td>
<td></td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>5.26 / 16.28</td>
<td></td>
</tr>
<tr>
<td>Disturbance Handler</td>
<td>1.75 / 0.91</td>
<td></td>
</tr>
<tr>
<td>Resource Allocator</td>
<td>7.02 / 16.88</td>
<td></td>
</tr>
<tr>
<td>Negotiator</td>
<td>0/0</td>
<td></td>
</tr>
</tbody>
</table>
7.2.1.3 The mail record

Table 7.3 and 7.4 contain the results of the analysis of the mail records. In Table 7.3 the incoming mail is categorised according to format, sender, and purpose. Most of the mail the State Secretary received was in the form of letters. He received only three periodicals during the week. A check with the secretary revealed that the State Secretary normally received a greater number of magazines and newsletters. The other forms of mail were memos, reports and minutes, the majority of which came from the subordinates. In fact the subordinates sent 46% of the mails. The State Secretary also received a substantial amount of mail from private organisations. Most of these were letters and reports about new and ongoing projects in which the organisations were involved. About 10% of the mail came from the State Secretary's peers who were heads of other government organisations. These were mostly letters inviting the State Secretary to give talks and participate in courses and conferences. A few came from subordinates of other government organisations. The mail comprised a mixture of letters and minutes of outside meetings which the State Secretary had participated. The State Secretary received a letter from his superior, the head of the civil service, informing the appointment of a senior officer to one of the state agencies. 40% of the mail the State Secretary received was basically requests made upon him. Nearly half of these requests were status requests, that is requests made upon the State Secretary due to his position in the organisation. An example of this was a letter from a peer asking the State Secretary to be the main speaker in a seminar. Another major form of requests were authority requests. These requests were made upon the State Secretary mostly by his subordinates, seeking authorisation for exception to normal procedures, seeking approval for a budget or getting acceptance for a decision. Some examples of this mail were a memo from a subordinate requesting an approval for a special budget and another requesting for a no-pay leave. The last type of request made upon the State Secretary was that of solicitation. Solicitations were requests made upon the State Secretary by outside organisations asking the State secretary to participate in conferences, others requesting him to consider their applications for projects in the state and a couple requesting personal donations. Almost 60% of the mail the SS received provided him with information. Examples were minutes of meetings and
information on staff appointment. Other informational mail were reports on operation such as a feedback report by the State Forestry Council and a report detailing anti-pollution measures taken by the state. There were also reports which were in response to the State Secretary earlier requests on specific cases. An example was a review report on the status of scholarships given for religious education. There were also letters highlighting specific problems to the State Secretary. A case in point was a letter from a private organisation emphasising water shortage problems and its effects on business. There were reports on certain proposed projects giving the State Secretary new ideas. One was a proposal to build a Disneyworld project in the state. A couple of letters informed the State Secretary on certain events that will be taking place and there was one general report on the development budget estimates for the state.

Table 7.3: Analysis of the incoming mail record of the State Secretary

<table>
<thead>
<tr>
<th>Category</th>
<th>State Secretary</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pieces received</td>
<td>139</td>
<td>100</td>
</tr>
<tr>
<td><strong>Form of input</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter</td>
<td>88</td>
<td>63.31</td>
</tr>
<tr>
<td>Memo</td>
<td>18</td>
<td>12.95</td>
</tr>
<tr>
<td>Report</td>
<td>16</td>
<td>11.51</td>
</tr>
<tr>
<td>Minutes</td>
<td>14</td>
<td>10.07</td>
</tr>
<tr>
<td>Periodical</td>
<td>3</td>
<td>2.16</td>
</tr>
<tr>
<td><strong>Sender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subordinate</td>
<td>64</td>
<td>46.04</td>
</tr>
<tr>
<td>Peer</td>
<td>15</td>
<td>10.79</td>
</tr>
<tr>
<td>Subordinate from other govt.org</td>
<td>8</td>
<td>5.76</td>
</tr>
<tr>
<td>Outside organisation (Private)</td>
<td>51</td>
<td>36.69</td>
</tr>
<tr>
<td>Superior</td>
<td>1</td>
<td>0.72</td>
</tr>
<tr>
<td><strong>Purpose of input mail</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>1</td>
<td>0.72</td>
</tr>
<tr>
<td>Status requests</td>
<td>26</td>
<td>18.7</td>
</tr>
<tr>
<td>Solicitation</td>
<td>8</td>
<td>5.76</td>
</tr>
<tr>
<td>Authority request</td>
<td>22</td>
<td>15.83</td>
</tr>
<tr>
<td><strong>Total requests</strong></td>
<td>56</td>
<td>40.29</td>
</tr>
<tr>
<td>Reference data</td>
<td>45</td>
<td>32.37</td>
</tr>
</tbody>
</table>
Table 7.4 contains the analysis of the outgoing mail record of the State Secretary. There were a total of 63 items that were sent out. Out of these, 52 were in response to mails received and the State Secretary initiated another 11. This mail was in the form of letters, memos and reports. More than half were in the form of forwarded letters. The State Secretary forwarded many letters to his two deputies. Some of these forwarded letters requested the deputies for more information and some asking them to take specific actions. There were also a couple of forwarded memos, reports and minutes. In these cases, the State Secretary was playing the role of a disseminator, filtering information to his subordinates. Hence, subordinates were the main target of his output mail, accounting for more than two thirds of the total output. The State Secretary also sent several letters to private organisations. Most were in reply to their written requests and the others were invitations to participate in some state functions. The State Secretary sent a report and three letters to his superior in the Public Service Department. All these were self-initiated. There were two letters sent to his peers, both were invitation letters to state functions. Looking at the purpose of the output mail, one was an acknowledgement to some inputs received, while the majority was to pass information and to delegate requests to subordinates.

Table 7.4: Analysis of the outgoing mail record of the State Secretary

<table>
<thead>
<tr>
<th>Category</th>
<th>Numbers</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number reactions to inputs</td>
<td>52</td>
<td>82.54</td>
</tr>
<tr>
<td>Number self-initiated</td>
<td>11</td>
<td>17.46</td>
</tr>
<tr>
<td><strong>Total output</strong></td>
<td>63</td>
<td>100</td>
</tr>
<tr>
<td>Output as percent of input</td>
<td></td>
<td>45.32</td>
</tr>
</tbody>
</table>
7.2.2 Secretary-General

7.2.2.1 Chronological record

Table 7.5 contains the results of the analysis of the chronological record of the Secretary-General. The Secretary-General spent a total of 37.75 hours working in the one week period and performed 71 distinct activities. These activities were grouped under eight different categories. The first seven categories were similar to those of the State Secretary. These were deskwork, telephone calls, scheduled meetings, unscheduled meetings, ceremonial duty, briefing, and observational tour. The eighth category was exhibition and conference.

The Secretary-General spent most of his time attending meetings. He participated in 33 meetings which took more than half of his working hours. More than two-thirds of these meetings were unscheduled meetings with the subordinates. Similar to those of the SS, these unscheduled meetings were of short duration and thus only accounted for about 13% of his time. Scheduled meetings on the other hand amounted to nearly 40% of the
total working hours. The Secretary-General had on average 4 deskwork sessions a day. 
He spent most of these uninterrupted sessions handling documents, going through letters 
and reports. There were very few telephone calls, on average there was only about one 
call per day. The Secretary-General had a couple of ceremonial duties, spending an hour 
and a quarter on these. The rest of his time was spent on attending a briefing, a tour to an 
aricultural park, and going to an exhibition and conference.

Nearly a third of the activities lasted for less than 10 minutes duration and only 14% of 
the activities lasted longer than an hour.

Table 7.5: Analysis of the chronological record of 
the Secretary-General.

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total hours worked</td>
<td>37.75</td>
</tr>
<tr>
<td>Hours in travel to outside event (not included)</td>
<td>3.82</td>
</tr>
<tr>
<td>Total amount of mail</td>
<td>97</td>
</tr>
<tr>
<td>Total number of activities</td>
<td>71</td>
</tr>
</tbody>
</table>

**Desk work**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of sessions</td>
<td>25</td>
</tr>
<tr>
<td>Time on desk-work (hours)</td>
<td>10</td>
</tr>
<tr>
<td>Average duration of desk-work (hours)</td>
<td>0.4</td>
</tr>
<tr>
<td>Proportion of time</td>
<td>26.49%</td>
</tr>
</tbody>
</table>

**Telephone calls**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of calls</td>
<td>8</td>
</tr>
<tr>
<td>Time on Telephone (hours)</td>
<td>0.62</td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td>0.08</td>
</tr>
<tr>
<td>Proportion of time</td>
<td>1.64%</td>
</tr>
</tbody>
</table>

**Scheduled meetings**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of meetings</td>
<td>9</td>
</tr>
<tr>
<td>Time in meetings (hours)</td>
<td>14.85</td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td>1.65</td>
</tr>
<tr>
<td>Proportion of time</td>
<td>39.34%</td>
</tr>
</tbody>
</table>

**Unscheduled meetings**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of meetings</td>
<td>24</td>
</tr>
<tr>
<td>Time in meetings (hours)</td>
<td>5.19</td>
</tr>
</tbody>
</table>
Average duration (hours) | 0.22
---|---
Proportion of time | 13.75%

**Ceremonial duty**

| Number of ceremonies | 2 |
| Time spent on attending ceremonies (hours) | 1.25 |
| Average duration (hours) | 0.63 |
| Proportion of time | 3.31%

**Briefing**

| Number of briefings | 1 |
| Time spent attending briefings (hours) | 1.17 |
| Average duration (hours) | 1.17 |
| Proportion of time | 3.10%

**Tour**

| Number of tours | 1 |
| Time spent (hours) | 1.75 |
| Average duration (hours) | 1.75 |
| Proportion of time | 4.64%

**Exhibition & Conference**

| Number of exhibitions | 1 |
| Time spent on exhibitions (hours) | 2.92 |
| Average duration (hours) | 2.92 |
| Proportion of time | 7.74%

### 7.2.2.2 Contact record

Table 7.6 presents the analysis of the Secretary-General’s contact record. The Secretary-General spent 73.5% of his working hours in contact activities. Nearly 70% of these activities were brief contacts through unscheduled meetings and telephone calls. His most time-consuming contact activities were scheduled meetings which amounted to more than half of his contact time. More than 60% of the Secretary-General contact activities were with his subordinates. This was followed by contacts with private organisations, his superiors, peers and subordinates from other government departments. The superiors that the Secretary-General met during the week were the agriculture minister and his deputy. Another was the Prime Minister. Most of these contacts were face-to-face. The Secretary-General had normative influence on half of the contact activities. About 2% of the activities had both strong normative and informational influence. With role type, the
Secretary-General had a slightly more informational than interpersonal roles. Decisional roles were substantially less. Most of the interpersonal roles were employed through brief informal meetings with subordinates, hence the relatively little time spent on these roles. Informational roles, on the other hand, were mostly deployed during the long scheduled meetings. Furthermore, in several of these meetings multiple informational roles were assigned. Among the three categories of interpersonal roles, leader was the most frequent. The monitoring role was the most frequent among informational roles, while resource allocator was the main decisional role. The role of entrepreneur was not reflected in any of the Secretary-General's activities during the observation.

Table 7.6: Analysis of the contact record of the Secretary-General

<table>
<thead>
<tr>
<th>Category</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time in verbal contact (hours)</td>
<td>27.75</td>
</tr>
<tr>
<td>Total number of verbal contacts</td>
<td>46</td>
</tr>
<tr>
<td><strong>Activity: Percent of contacts/Percent of time</strong></td>
<td></td>
</tr>
<tr>
<td>Scheduled meetings</td>
<td>19.57/53.51</td>
</tr>
<tr>
<td>Unscheduled meetings</td>
<td>52.17/18.70</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>17.39/2.23</td>
</tr>
<tr>
<td>Ceremonial duties</td>
<td>4.35/4.50</td>
</tr>
<tr>
<td>Briefing</td>
<td>2.17/4.22</td>
</tr>
<tr>
<td>Tours</td>
<td>2.17/6.31</td>
</tr>
<tr>
<td>Exhibition &amp; Conference</td>
<td>2.17/10.52</td>
</tr>
<tr>
<td><strong>Source: Percent of contacts/Percent of time</strong></td>
<td></td>
</tr>
<tr>
<td>Superior</td>
<td>10.87/9.55</td>
</tr>
<tr>
<td>Subordinate</td>
<td>60.87/49.23</td>
</tr>
<tr>
<td>Subordinate from another department</td>
<td>4.35/5.98</td>
</tr>
<tr>
<td>peer</td>
<td>6.52/0.97</td>
</tr>
<tr>
<td>Outside institution</td>
<td>17.39/34.27</td>
</tr>
<tr>
<td><strong>Medium:Percent of contacts/Percent of time</strong></td>
<td></td>
</tr>
<tr>
<td>Face-to-face</td>
<td>82.61/97.77</td>
</tr>
<tr>
<td>Telephone</td>
<td>17.39/2.23</td>
</tr>
<tr>
<td><strong>Influence Type:Percent of contacts/Percent of time</strong></td>
<td></td>
</tr>
<tr>
<td>Informational</td>
<td>47.83/72.11</td>
</tr>
<tr>
<td>Normative</td>
<td>50.00/16.18</td>
</tr>
<tr>
<td>Informational/normative</td>
<td>2.17/11.71</td>
</tr>
<tr>
<td>Role Type: Percent of contacts /Percent of time</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Figurehead</td>
<td>17.39 / 6.99</td>
</tr>
<tr>
<td>Leader</td>
<td>30.43 / 5.51</td>
</tr>
<tr>
<td>Liaison</td>
<td>2.17 / 2.70</td>
</tr>
<tr>
<td><strong>(Interpersonal)</strong></td>
<td><strong>49.99 / 15.20</strong></td>
</tr>
<tr>
<td>Monitor</td>
<td>26.09 / 58.13</td>
</tr>
<tr>
<td>Disseminator</td>
<td>19.57 / 34.81</td>
</tr>
<tr>
<td>Spokesman</td>
<td>10.87 / 18.41</td>
</tr>
<tr>
<td><strong>(Informational)</strong></td>
<td><strong>56.53 / 111.35</strong></td>
</tr>
<tr>
<td>Entrepreneur</td>
<td></td>
</tr>
<tr>
<td>Disturbance Handler</td>
<td>2.17 / 1.62</td>
</tr>
<tr>
<td>Resource Allocator</td>
<td>4.35 / 10.74</td>
</tr>
<tr>
<td>Negotiator</td>
<td>2.17 / 11.71</td>
</tr>
<tr>
<td><strong>(Decisional)</strong></td>
<td><strong>8.69 / 24.07</strong></td>
</tr>
</tbody>
</table>

### 7.2.2.3 Mail record

Table 7.7 shows the analysis of the incoming mail record of the Secretary-General. The Secretary-General received 97 items, 40% of which were in the form of letters. Periodicals formed 16% of the mail. Interestingly nearly a third of these were computer magazines and computer brochures. Other forms of mail were memos which all came from the subordinates, reports, minutes and several copies of letters sent by the minister. The main sender of the Secretary-General’s mail were his subordinates who sent half the mail. Mail from private organisations accounted for nearly 28%. More than half of these were periodicals. The Secretary-General also received several letters from his peers and subordinates from other government organisations and several copies of letters from the minister. Looking at the purpose nearly two-thirds of the mail was of an informational nature while about one-third were requests. Most of the requests were status requests such as a letter from a peer inviting the Secretary-General to attend the opening ceremony of a conference. Some were solicitations. An example was a letter requesting the ministry to participate in a seminar. Several mails were asking for the Secretary-General’s authorisation. One of these was a memo asking the Secretary-General’s approval on the award of a tender. Examples of informational mails were minutes of meeting which were mainly used as references. Then there were reports on operation. An example of this was the report on improvement projects of the agricultural park which the Secretary-General
visited during the observation week. He also received mail which responded to his earlier
inquiries on certain situations. One such mail was a memo from a subordinate giving him
the measures proposed to overcome the spread of cattle disease in one of the east coast
states. There were also letters highlighting certain issues and problems. Copies of letters
sent by the minister highlighted some problems faced by the farmers in the minister's
constituency. The Secretary-General received several letters giving him ideas on some
topic such as one which suggested a change of name for the ministry. Other informational
mail were periodicals, letters informing the Secretary-General on some events and
general reports. One example of the general report the Secretary-General received was the
annual report of the Fishery Department.

Table 7.7: Analysis of the incoming mail record of
the Secretary-General

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pieces received</td>
<td>97</td>
<td>100</td>
</tr>
<tr>
<td><strong>Form of input</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter</td>
<td>39</td>
<td>40.21</td>
</tr>
<tr>
<td>Memo</td>
<td>12</td>
<td>12.37</td>
</tr>
<tr>
<td>Report</td>
<td>14</td>
<td>14.43</td>
</tr>
<tr>
<td>Minutes</td>
<td>11</td>
<td>11.34</td>
</tr>
<tr>
<td>periodical</td>
<td>16</td>
<td>16.49</td>
</tr>
<tr>
<td>copy of letter</td>
<td>5</td>
<td>5.15</td>
</tr>
<tr>
<td><strong>Sender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subordinate</td>
<td>49</td>
<td>50.52</td>
</tr>
<tr>
<td>Peer</td>
<td>6</td>
<td>6.18</td>
</tr>
<tr>
<td>Subordinate from other govt. organisation</td>
<td>7</td>
<td>7.22</td>
</tr>
<tr>
<td>Outside organisation (Private)</td>
<td>27</td>
<td>27.84</td>
</tr>
<tr>
<td>Superior</td>
<td>5</td>
<td>5.15</td>
</tr>
<tr>
<td>Superior from other govt. organisation</td>
<td>3</td>
<td>3.09</td>
</tr>
<tr>
<td><strong>Purpose of input mail</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status requests</td>
<td>17</td>
<td>18.7</td>
</tr>
<tr>
<td>Solicitation</td>
<td>5</td>
<td>5.76</td>
</tr>
<tr>
<td>Authority requests</td>
<td>13</td>
<td>15.83</td>
</tr>
<tr>
<td><strong>Total requests</strong></td>
<td>35</td>
<td>36.08</td>
</tr>
<tr>
<td>Reference data</td>
<td>19</td>
<td>19.59</td>
</tr>
</tbody>
</table>
Table 7.8 presents the results of the analysis of the outgoing mail records of the Secretary-General. There were 32 items sent out, 22 of which were in response to mail received, while the other 10 were self-initiated. Mail was in the form of letters, memos, minutes and reports. Half of these were forwarded items. The Secretary-General forwarded all the 5 computer magazines to the IS manager. He forwarded a couple of reports and several letters to his deputy. The subordinates were the main target of the Secretary-General’s mail. Others were distributed between his superiors, peer and private organisations. Two of the letters were sent as an acknowledgement to some information the Secretary-General received. Several were replies to written requests. Half of the mail initiated by the Secretary-General were memos sent to subordinates congratulating them on excellent service.

Table 7.8: Analysis of the outgoing mail record of
the Secretary-General

<table>
<thead>
<tr>
<th>Category</th>
<th>Numbers</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number reactions to inputs</td>
<td>22</td>
<td>68.75</td>
</tr>
<tr>
<td>Number self-initiated</td>
<td>10</td>
<td>31.25</td>
</tr>
<tr>
<td><strong>Total output</strong></td>
<td><strong>32</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>Output as percent of input</td>
<td></td>
<td>32.99</td>
</tr>
<tr>
<td>Form of output mail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Memo</td>
<td>7</td>
<td>21.88</td>
</tr>
<tr>
<td>Report</td>
<td>1</td>
<td>3.13</td>
</tr>
<tr>
<td>Forwarded letter</td>
<td>7</td>
<td>21.88</td>
</tr>
<tr>
<td>Forwarded periodical</td>
<td>5</td>
<td>15.63</td>
</tr>
<tr>
<td>Forwarded minute</td>
<td>2</td>
<td>6.25</td>
</tr>
<tr>
<td>Forwarded report</td>
<td>2</td>
<td>6.25</td>
</tr>
<tr>
<td>Target of output mail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Subordinate</td>
<td>23</td>
<td>71.88</td>
</tr>
<tr>
<td>Superior</td>
<td>1</td>
<td>3.13</td>
</tr>
<tr>
<td>Superior (Other department)</td>
<td>3</td>
<td>9.38</td>
</tr>
<tr>
<td>Peer</td>
<td>1</td>
<td>3.13</td>
</tr>
<tr>
<td>Outside organisation (Private)</td>
<td>4</td>
<td>12.5</td>
</tr>
</tbody>
</table>

| Purpose of output mail |  |  
|------------------------|--|--|  
| Acknowledge input      | 1  | 3.13  |  
| Reply to information received | 1  | 3.13  |  
| Reply to written request | 4  | 12.5  |  
| Forward information to subordinate | 12 | 37.5  |  
| Forward request to subordinate | 4  | 12.5  |  
| originate letter/memo/report | 10 | 31.25 |  

7.2.3 Prime Minister

7.2.3.1 Chronological record

Table 7.9 contains the results of the analysis of the chronological record of the P.M. There were 76 activities amounting to a total of 56.63 working hours. The activities were grouped into 12 categories. Six were similar to the State Secretary and the Secretary-General. These were deskwork, telephone call, scheduled meeting, unscheduled meeting, visits and observational tour, and briefing. The other six were official reception, official signing and launching, official lunches and dinners, dialogue sessions, speeches, and evening work.

The P.M. has 16 deskwork sessions throughout the week amounting to about half an hour per session. He worked without interruptions during these sessions, drafting and editing speeches, and going through the mail. The uninterrupted time was sometimes used to scan through the EIS. The P.M. did not receive any telephone calls during the week. All calls to the P.M. were filtered and channelled to the appropriate supporting officers. Only calls from foreign heads of states were passed to the P.M. During the observation week there was none. He however made several brief telephone calls. Some were personal to the immediate family and some to heads of corporations. The P.M. spent a third of his time attending 23 scheduled meetings. He however had only 3 brief unscheduled meetings, all with the Deputy P.M. The P.M. gave three speeches during the week and
attended one reception welcoming the visit of the Hungarian Prime Minister. He was also involved in a signing ceremony and the launching of a new car model. The P.M. also spent some time on visits and attended a couple of briefings. There were also dialogue sessions which demanded some of the P.M.’s time. The P.M. attended 9 official lunches and dinners. These accounted for nearly 17% of his time. The P.M. went through many of the reports he received at home, recording six and a half hours of evening work.

TABLE 7.9: Analysis of the chronological record of the Prime Minister

<table>
<thead>
<tr>
<th>Category</th>
<th>Total hours worked</th>
<th>Hours in travel to outside event (not included)</th>
<th>Hours of evening work</th>
<th>Hours of evening activity</th>
<th>Total amount of mail</th>
<th>Total number of activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desk work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of sessions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time on desk-work (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average duration of desk-work (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone calls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of calls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time on Telephone (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of meetings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in meetings (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unscheduled meetings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of meetings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in meetings (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average duration (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>No.</td>
<td>Time spent (hours)</td>
<td>Average duration (hours)</td>
<td>Proportion of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----</td>
<td>--------------------</td>
<td>--------------------------</td>
<td>-------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech</td>
<td></td>
<td>3</td>
<td>2.25</td>
<td>3.97%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time spent giving speeches (hours)</td>
<td></td>
<td></td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Official reception (foreign heads of states)</td>
<td>1</td>
<td>0.42</td>
<td>0.42</td>
<td>0.74%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Official signing &amp; launching</td>
<td>2</td>
<td>1.67</td>
<td>0.83</td>
<td>2.95%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visits and tours</td>
<td>2</td>
<td>2.5</td>
<td>1.25</td>
<td>4.41%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Briefings</td>
<td>2</td>
<td>2.08</td>
<td>1.04</td>
<td>3.67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dialogues and questions and answers sessions</td>
<td>3</td>
<td>3.5</td>
<td>1.17</td>
<td>6.18%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Official lunches and dinners</td>
<td>9</td>
<td>9.58</td>
<td>1.06</td>
<td>16.92%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening work</td>
<td>3</td>
<td>6.5 hours</td>
<td>2.16 hours</td>
<td>11.87%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7.10 shows the analysis of the P.M.'s contact record. Time spent in contact with another person or persons was 42.25 hours or about 75% of all his working hours. The majority of these contacts were through scheduled meetings. Many of these meetings were one-to-one meeting. The record also showed that the executives were the people the P.M. spent most time with. Next were citizens. The rest were distributed between legislative, partisans, and those from abroad. Most of the contacts were face-to-face. Telephone contacts accounted for only about 1% of the contact time. In terms of influence, the P.M. had a relatively higher normative influence compared to informational. This indicates that his position as a P.M. was significant in influencing others. Normative influence was felt in nearly 60% of the contact activities compared to 33% of informational influence. 7% of the activities had both normative and informational influence. Looking at role type, the P.M.'s roles were more interpersonal than informational or decisional. His roles as leader and figurehead were clearly significant. Only in one contact activity was the P.M. playing the role of a liaison. This was a brief meeting the P.M. had with the P.M. of Hungary. Among the informational roles, monitor was the most prominent. However, there were activities which demanded the P.M. to act as disseminator and spokesman. He was a disseminator during a meeting with the legislative in his state visit. He acted as cabinet spokesman in his meeting with the federal ruler, briefing the latter on issues that would be discussed. There were very few instances of decisional roles. Nevertheless, three decisional roles were observed. Entrepreneur was clearly seen during a meeting with the National IT Council where the P.M. presented several ideas and innovations. He was a disturbance handler during a meeting with a leader of a corporation and partly acted as resource allocator during cabinet meeting.

**TABLE 7.10: Analysis of the contact record of the Prime Minister**

<table>
<thead>
<tr>
<th>Category</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time in verbal contact (hours)</td>
<td>42.25</td>
</tr>
<tr>
<td>Total number of verbal contacts</td>
<td>57</td>
</tr>
<tr>
<td>Activity: Percent of contacts/Percent of time</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Percent of Contacts</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Scheduled meetings</td>
<td>40.35 / 45.37</td>
</tr>
<tr>
<td>Unscheduled meetings</td>
<td>5.26 / 1.37</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>15.79 / 1.18</td>
</tr>
<tr>
<td>Speeches</td>
<td>5.26 / 5.33</td>
</tr>
<tr>
<td>Official receptions</td>
<td>1.75 / 0.99</td>
</tr>
<tr>
<td>Official signing and launching</td>
<td>3.51 / 3.95</td>
</tr>
<tr>
<td>Visits and tours</td>
<td>3.51 / 5.92</td>
</tr>
<tr>
<td>Briefings</td>
<td>3.51 / 4.92</td>
</tr>
<tr>
<td>Dialogues and Q &amp; A sessions</td>
<td>5.26 / 8.28</td>
</tr>
<tr>
<td>Official lunches and dinners</td>
<td>15.79 / 22.67</td>
</tr>
</tbody>
</table>

**Source: Percent of contacts /Percent of time**

<table>
<thead>
<tr>
<th>Type</th>
<th>Percent of Contacts</th>
<th>Percent of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislative</td>
<td>12.28 / 7.98</td>
<td></td>
</tr>
<tr>
<td>Executive</td>
<td>29.82 / 40.02</td>
<td></td>
</tr>
<tr>
<td>Abroad</td>
<td>10.53 / 8.88</td>
<td></td>
</tr>
<tr>
<td>citizen</td>
<td>42.11 / 36</td>
<td></td>
</tr>
<tr>
<td>partisan</td>
<td>5.26 / 7.10</td>
<td></td>
</tr>
</tbody>
</table>

**Medium**: Percent of contacts /Percent of time

<table>
<thead>
<tr>
<th>Medium</th>
<th>Percent of Contacts</th>
<th>Percent of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>84.21 / 98.82</td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td>15.79 / 1.16</td>
<td></td>
</tr>
</tbody>
</table>

**Influence Type**: Percent of contacts /Percent of time

<table>
<thead>
<tr>
<th>Type</th>
<th>Percent of Contacts</th>
<th>Percent of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informational</td>
<td>33.33 / 44.95</td>
<td></td>
</tr>
<tr>
<td>Normative</td>
<td>59.65 / 45.96</td>
<td></td>
</tr>
<tr>
<td>Informational/normative</td>
<td>7.02 / 9.07</td>
<td></td>
</tr>
</tbody>
</table>

**Role Type**: Percent of contacts /Percent of time

<table>
<thead>
<tr>
<th>Type</th>
<th>Percent of Contacts</th>
<th>Percent of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figurehead</td>
<td>29.82 / 32.28</td>
<td></td>
</tr>
<tr>
<td>Leader</td>
<td>33.33 / 20.97</td>
<td></td>
</tr>
<tr>
<td>Liaison</td>
<td>1.75 / 0.59</td>
<td></td>
</tr>
<tr>
<td>(Interpersonal)</td>
<td>64.90 / 53.84</td>
<td></td>
</tr>
<tr>
<td>Monitor</td>
<td>31.58 / 40.80</td>
<td></td>
</tr>
<tr>
<td>Disseminator</td>
<td>8.77 / 18.13</td>
<td></td>
</tr>
<tr>
<td>Spokesman</td>
<td>10.53 / 10.44</td>
<td></td>
</tr>
<tr>
<td>(Informational)</td>
<td>50.88 / 69.37</td>
<td></td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>3.51 / 16.30</td>
<td></td>
</tr>
<tr>
<td>Disturbance Handler</td>
<td>1.75 / 1.18</td>
<td></td>
</tr>
<tr>
<td>Resource Allocator</td>
<td>3.51 / 16.17</td>
<td></td>
</tr>
<tr>
<td>Negotiator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Decisional)</td>
<td>8.77 / 33.65</td>
<td></td>
</tr>
</tbody>
</table>

* Written media: 25.78% of total hours worked
7.2.3.3 Mail record

Table 7.11 shows the analysis of the P.M.’s incoming mail records. The Principal Private Secretary filters all mail to the P.M. During the observation week only 43 were passed to him. There were 19 letters, 15 reports while the rest were memos and minutes. The P.M. took most reports home to read. Most of the mail was from ministers and civil servants. Letters from citizens formed a small proportion of the input mails. Looking at the purposes of the mail, 23% of them were requests and 77% were of an informational nature. The requests included status requests, authority requests and solicitation. Several letters had the form of status requests such as a letter from an executive requesting the presence of the P.M. during signing of a memorandum of understanding (MOU). An example of authority request was a letter seeking approval for the appointment of board members. An example of solicitation was a letter requesting to be a government supplier.

In terms of informational mail, there were general reports such as a company annual report. Many were reports of situations that had been queried by the P.M. earlier. An example was a report on a proposal for the listing of a bank on the stock exchange. The P.M. received some mail proposing new projects and procedures. Some reminded him of events that would be taking place such as a letter from the ministry of foreign affairs on a visit of Mauritius Prime Minister. There were also feedback reports on certain projects and events that had taken place such as reports of border discussions between Malaysia and Thailand. The P.M. also received a letter from a citizen reporting about company malpractice. Other mail that he received were used as references. These were mostly minutes of meetings.

<table>
<thead>
<tr>
<th>Category</th>
<th>Numbers</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pieces received</td>
<td>43</td>
<td>100</td>
</tr>
<tr>
<td>Form of input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter</td>
<td>19</td>
<td>44.19</td>
</tr>
<tr>
<td>Memo</td>
<td>3</td>
<td>6.98</td>
</tr>
<tr>
<td>Report</td>
<td>15</td>
<td>34.88</td>
</tr>
<tr>
<td>Minutes</td>
<td>6</td>
<td>13.95</td>
</tr>
</tbody>
</table>

**TABLE 7.11: Analysis of the incoming mail records of the Prime Minister**
Table 7.12 presents the analysis of the outgoing mail record of the P.M. There were only 8 items sent out during the week, all were in the form of letters. This formed about 18% of the mail received. Only 2 of the letters were initiated by the P.M. One was to the Minister of Defence on aids for armed forces family and another was a letter of recommendation to a foreign dignitary. The other 6 letters were sent to heads of corporations (citizens) and a Member of Parliament (legislative) and civil servants. These were replies to information received and replies to requests made upon him as a P.M. An example was a reply to an invitation for an opening ceremony of a new highway and another was a reply to an invitation for an alumni reunion.

**TABLE 7.12: Analysis of the outgoing mail record of the Prime Minister**

<table>
<thead>
<tr>
<th>Category</th>
<th>PM</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number reactions to inputs</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>Number self-initiated</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total output</strong></td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Output as percent of input</td>
<td></td>
<td>18.60</td>
</tr>
</tbody>
</table>
### Form of output mail

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>8</td>
<td>100</td>
</tr>
</tbody>
</table>

### Target of output mail

<table>
<thead>
<tr>
<th>Target</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>Legislative</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Abroad</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Citizen</td>
<td>3</td>
<td>37.5</td>
</tr>
</tbody>
</table>

### Purpose of output mail

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reply to written request</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Reply to information received</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>Originate letter</td>
<td>2</td>
<td>25</td>
</tr>
</tbody>
</table>

#### 7.2.4 Comparing work activities of the State Secretary, the Secretary-General and the Prime Minister

Although the three executives were different in that one was a P.M., another was a civil service head of a state government, and another, a civil service head of a ministry, the results indicate that there were similarities in their work activities. All three executives were active in the work activities that were categorised. The three categories of executive roles, interpersonal, informational and decisional were all applicable to each of them. All the three played a considerably less decisional role compared to interpersonal and informational roles. Each preferred face-to-face meetings and had contact with the same types of people, subordinates, superiors, peers and those from private organisations. They had more normative than informational influence on those people they came into contact with. They received more informational mails than those mails making requests. Not only do they seem to do the same kind of things but for many of the activities the same general proportions held for the three executives. Strong similarities appeared for example in the following: the number of activities undertaken, the number of verbal contacts they had, the number and duration of telephone calls, the proportion of time spent on scheduled meetings, the number of briefings attended and the proportion of time spent on these. There were more similarities between the State Secretary and the Secretary-General, both being the civil service heads of their respective organisations. There were many brief informal meetings where they displayed their leadership role. Nearly two-thirds of their contacts were with subordinates. Both displayed a relatively
more informational than interpersonal roles. They received a considerable amount of mail and forwarded a significant amount to their subordinates.

However, being in the state government, the State Secretary had much more ceremonial functions. He also attended many more scheduled meetings and involved in many varied programmes. For example he spent three hours going round on anti-vice activities. The Secretary General on the other hand spent very little time on ceremonial duties. Instead he spent a quarter of his time working uninterrupted at his desk.

Looking at the P.M., there were a variety of differences. The P.M. had other activities not found with the other two executives. There were reception of foreign dignitaries, official signing and launching of events, official lunches and dinners, and the giving of speeches. However, these do not detract from the common conclusions. These activities except for the speeches can be generally categorised as ceremonial duties. Everyday of the week the P.M. had to attend these ceremonial duties. A major difference between the P.M. and the other two executives was in the number of unscheduled meetings. The P.M. had very few unscheduled meetings while the State Secretary and the Secretary-General both had more unscheduled than scheduled meetings. Unlike these two executives where subordinates could walk in to see them, with the P.M. it was not the case. Most meetings were scheduled. Subordinates within the P.M.'s office did not normally go directly to see the P.M. They had to go through the P.M.'s Principal Private Secretary (a very senior civil servant). However, it is important to note that it is not unusual for the P.M. to call for specific officers to his office. As a result of this, the P.M.'s working day was more organised. He knew the programme for the day and was seldom interrupted. While the two other executives had considerable contacts with subordinates, the P.M. had more contact with heads of corporations (citizens). Being a leader of a country who believed that the private sector is a key player in the country's economic development, this was not a surprise. Even though all three executives had a greater normative than informational influence, the proportion was considerably higher for the P.M. His normative influence nearly doubled that of his informational influence. While the other two executives displayed more informational roles, the P.M. displayed a much greater interpersonal roles. The P.M. received a significantly fewer mail compared to the State Secretary and
the Secretary-General. The reason was that the P.M.’s mail was filtered and he only 
received mail that were considered important by his private secretary. Unlike the other 
two executives, the P.M. also did not forward any mail to his officers. However, from the 
information gathered, the P.M. does sometimes forward some mail to his cabinet 
members and some senior civil servants. The P.M. only initiated a couple of letters. His 
Principal Private Secretary answered most mail. The proportion of his output mail to that 
of his input mail was very much lower compared to the State Secretary and the Secretary-
General.

7.3 Results of the EIS baseline study
The second section of the chapter examines the extent and the nature of use of EIS in 
three agencies of the Malaysian government: Selangor state government, Ministry of 
Agriculture, and the P.M.’s office. The study used a technique based on one developed by 
Conoco. The objective of this exercise was twofold. First, to affirm that it was applicable 
to the Malaysian government. Secondly, to establish a baseline of EIS applications for 
experiments in BM conducted in the third part of the study.

7.3.1 State government
The State Secretary initiated the EIS in 1996. He had experience using EIS in his 
previous organisation. There were seven applications at the time of the study. Most of the 
applications had their sources in existing internal databases. The applications were:

i. State statistical information system

The system contains socio-economic data about the state. This includes data on the 
economic growth of the state, its infrastructure facilities and its educational and health 
facilities. The objective of the system is to aid in building a socio-economic model 
which can be used to evaluate the impact of the state development projects.

ii. Low-cost housing system

The system contains information on low-cost housing projects being undertaken, 
ownership of low-cost houses and demand for these houses. Analysis is by districts. 
The objective is to assist the state in the planning of its housing needs.
iii. Squatters information system

The system contains information on the squatters’ population of the state. Its objective is to help in formulating strategies to control and reduce this problem.

iv. State investment information system

The system contains profiles of investors in terms of industry, output capacity, investment value, investment incentives obtained, restrictions imposed, manpower needs and location. The objective is to provide executives with better understanding on the investment status of the state.

v. Educational loan system

The system contains statistics on the educational loan awarded by the state. Information is categorised by race, income group, gender, loan amount, places or countries of study, type of courses and level of studies. The information is generally used as references. Executives reference this information for speeches, requests, and reports.

vi. Villages and district profile

The system contains basic information of villages and districts such as population, infrastructural facilities and educational and health facilities. The objective is for the state to understand the socio-economic status of these villages and districts and helps it to plan its development projects.

vii. Electronic mail

This system allows executives to communicate among themselves and their subordinates. The EIS also has a link to World Wide Web.

The most utilised application is the low-cost housing system followed by the state statistical system. Internet access is also frequent. Mapping the applications onto the executive work model, five of the applications fall under the learning category, one under satisficing and the e-mail facility came under sensemaking. There are no applications under bargaining, commanding and persuading categories. Figure 7.1 categorises the list
of applications within the framework of theories of executive work. There are a number of well-developed databases in the organisation and the IS Unit had plans to develop more EIS applications based on the data derived from the databases.

![Figure 7.1: Mapping EIS applications within the executive work theory (State government)](image)

The use of the EIS is not widespread. The organisation chart in figure 7.2 shows the executives of the organisation. Even though all of them have been given access to the EIS, not all have used it. Executives who are active users of the system are the Chief Minister, the State Secretary, the State Legal Adviser, and the State Financial Officer. There are plans to provide the EIS to all middle level managers. In fact a few of them already have access to the EIS.

The use of the EIS is still in its early stages. The system is sometimes unstable and there are complaints from its users. During the study, the researcher witnessed an incident where the State Secretary was particularly upset at not being able to access the EIS. He wanted to check some information that was asked of him during an earlier meeting. He
commented, "Every time I wanted to access the system, there will be something wrong, no wonder it is difficult to encourage other officers to use it". An interview with the State Secretary revealed that he was very enthusiastic about the EIS, but time is a constraint and he could not tolerate frequent system failures. The State Financial Officer is generally satisfied with the system, but finds that some of the data is out of date. He remarked "I like and support the idea of having the EIS. I use the system. But the system people must ensure that the data is up-to-date."

FIGURE 7.2: Extract of an organisational chart of the Selangor state government.

The State Secretary finds the systems such as the state statistical system very beneficial in giving him basic understanding on the socio-economic status of the state. As a federal officer who was transferred to the state, the system proves very helpful. The investment information system gives him in-depth understanding of the investment activities of the
state. The State Financial Officer finds the low-cost housing system indispensable. He bases his planning and decisions on housing needs and projects on the information provided by the system. The State Financial Officer uses the information in this application to answer questions frequently raised in the State Legislative Assembly as the subject of low-cost housing is often used in political campaigns to gain support. To him the benefit is the fast and easy access to the information. Previously he has to depend on the districts to send him the information and sometimes the information was never sent. The squatters information system and the village and district profile are rarely used. The EIS group has not been able to update the data on these systems. Executives continue to communicate face-to-face. They have yet to make use of electronic mail. Hence, the benefit of sensemaking that is anticipated with regard to this facility has not been achieved.

7.3.2 Ministry of Agriculture
The Ministry of Agriculture had a long established IS department but only started to develop their EIS in 1995. There were ten EIS applications at the time of the study. These applications were:

i. Agricultural statistics
The system contains statistics on farmers such as the distribution of farmers by state, race, gender and land resources. It has statistics on flowers, fruits, vegetables, cash crops, paddy and industrial crops.

ii. Annual fishery statistics
The system contains statistics such as number of fishermen and licensed fishing vessels, number of approved foreign fishermen, statistics on marine fish landings, deep-sea fishing, production and value of ornamental fish, freshwater fish, and export and import of fishery commodities.

iii. Livestock information system
The system contains information on livestock population for a ten-year period and projections for the next twenty-five years. It has information on livestock population
by type and by state. There is also information on the production and consumption of livestock products, import and export of livestock products and average retail prices of livestock products for a ten-year period.

iv. Trade system
The system focuses on the import and export of food and agriculture products. The stated objective is to enable users to have fast retrieval of all these information.

v. Policy monitoring, directives and decisions
The system contains all policies, directives and decisions related to the ministry. The objective is to avoid issuing similar policies or giving conflicting directives and decisions.

vi. Senate questions and answers
The system contains all senate questions and answers related to the ministry for the past eight years. The objective is to avoid giving conflicting answers to the questions.

vii. Parliamentary questions and answers
The system contains all questions and answers raised in Parliament about the ministry. Similar to senate questions and answers, the objective was to maintain consistency in the answers.

viii. Press clippings
The system contains all newspaper articles about the ministry. The objective is to monitor views and criticisms raised about the ministry as a form of feedback.

ix. Minister's speeches
The system contains the speeches of the agriculture minister for the past three years. The objective was to give executives an understanding of the priorities and the important issues regarded by the minister.
x. Electronic mail

The system contains a widely used communication facility in the ministry.

All the applications except for electronic mail are primarily developed to provide easy, quick, and relevant information to executives. Hence the distribution of the EIS applications within the executive work theory is as in Figure 7.3. The applications primarily feed the executives with information on the ministry's activities.

![Figure 7.3: Distribution of EIS applications within the executive work theory (Ministry of Agriculture)](image)

The use of EIS is quite widespread in the ministry. All executives have access to the system. Figure 7.4 shows these executives. The facility is also open to all middle level managers. Among the executives, the most active user was the Deputy Secretary-General (Operations). The Secretary-General himself is also a frequent user. The minister and his deputy rarely use the system. They say this is due to lack of time.
The executives use the agricultural statistics and the trade system frequently. Press clippings and policy monitoring, directives and decisions are popular with the middle managers. To the Secretary-General the EIS has given him the benefit of quick and easy referencing. He had said that with the EIS he did not need to ask his subordinates for these information frequently. He says, "I seldom call my officers to get me the relevant files anymore. I now use the computer except for some special information". Electronic mail is widely used within the ministry. The Deputy Secretary-General encourages its use. It is his main form of communication, either internally with his subordinates or externally with his peers. He says that, "the telephone is only available from eight to five, but the computer is available twenty-four hours." Electronic mail greatly facilitates the Deputy Secretary-General's communication. He receives more feedback and views on certain issues as the mail provided a wider circle of participation.

FIGURE 7.4: Extract of an organisational chart of the Ministry of Agriculture
7.3.3 P.M.’s Office

The EIS arose from a cabinet decision of 1984. Originally the system was not known as EIS. It was called the chief executive information referencing system. The following year the name was changed to the chief executive information and management system. The term EIS was only introduced in 1993. However right from the beginning, the system had all the features of an EIS and the main users have been specifically executives. The objective of the system is to provide an integrated, user friendly and dynamic system to users using the latest available technology. In 1994 technical obsolescence caused the EIS to be moved from a mainframe-based system to a client server system.

There are four categories of the EIS applications:

i. Economy
Applications under this category are general economy, production and price, money and banking, government finance, external trade, transportation, and tourism.

ii. Politics
Applications under this category are, election results and analysis, by-elections, electoral analysis, profile of members of parliament and state representatives, and profile of senators.

iii. Administration
Applications under this category are, national policies, parliamentary questions and answers, organisations, P.M.’s speeches, profile of senior officers, statutory bodies, company profiles, federal and state awards, Multi-media Super Corridor Discussions (MSC), assets declaration, Hadith and Quran.

iv. Social
Applications under this category are, population, manpower, health, education, and welfare services.
Besides the four categories of information, the EIS also has links with other public databases such as the BERNAMA news-on-line service and the New Straits Time Library On-Line, a link to the World-Wide-Web and e-mail facility. Figure 7.5 shows the distribution of the EIS applications within the framework of the executive theories of work.

\[
\begin{array}{ccc}
\text{Understanding} & \text{Decision making} & \text{Implementing} \\
\text{Learning} & \text{Satisficing} & \text{Commanding} \\
\text{Bernama news} & \text{Electoral analysis} & \text{Profile of senators} \\
\text{New Straits Times} & \text{Informed organizations} & \text{Profile of MPs and state representatives} \\
\text{Population} & \text{Profile of major organisations} & \text{Profile of major corporations} \\
\text{Money and Banking} & \text{Statutory bodies - board of directors} & \\
\text{Government Finance} & \text{Assets declaration} & \\
\text{External Trade} & \text{Federal and state awards} & \\
\text{General Economy} & \text{Profile of MPs} & \\
\text{Production and Price} & \text{Parliamentary Q&A} & \\
\text{Transportation} & \text{Policies} & \\
\text{Manpower} & \text{Rural area} & \\
\text{Welfare Services} & \text{Infrastructure} & \\
\text{Tourism} & \text{Transportation} & \\
\text{Health} & \text{Tourism} & \\
\text{Education} & \text{Health} & \\
\text{Election results and analysis} & \text{Education} & \\
\text{By-elections} & \text{Election results and analysis} & \\
\text{PM's Speeches} & \text{By-elections} & \\
\text{MISC discussions} & \text{PM's Speeches} & \\
\text{E-mail} & \text{MISC discussions} & \\
\end{array}
\]

**FIGURE 7.5: The distribution of EIS applications within the executive work theory (P.M.'s Office)**

The office grants access of the EIS to all officers. However, executives are the users. Figure 7.6 shows an extract of the organisation chart of the P.M.'s office. Most of the executives, except for the political secretary, are users of the EIS. However, the type and the number of applications they access vary. The P.M. uses only very few of the applications, although he has at least accessed most of the applications once. He frequently accesses the *Quran* application.
The utilisation figures show that the users had accessed all the applications. However, there are some which have been accessed just for a few times while others have more frequent accesses. Among the more utilised applications were BERNAMA news, profile of senior officers, P.M.'s speeches, company profiles, organisations, Quran, New Straits Times Library-on-line, and Multi-Media Super Corridor (MSC) discussions. There are applications which have seasonal utilisation such as the election results and electoral analysis which are more frequently accessed during election years.

FIGURE 7.6: An organisational chart of PM's Office

The office does not have standard justification procedures. The development group will usually present a short paper to the senior officers highlighting the objectives of the identified application and the resources needed to develop it. The group does not do any cost benefit analysis. Requests for information from the P.M. usually results in the
development of related application. In such cases the request itself becomes the justification for the application.

Despite the long establishment of the EIS, the EIS group has been unable to prove that the systems have given sufficient benefits to justify their development and maintenance costs. However, the group do believe that the EIS has given the executives quick and easy reference to the information they need. Some of the applications such as the BERNAMA news have provided the executives with the most up-to-date happenings around the world. Executives express the same view. For example the Press Secretary remarked, “The BERNAMA news keep me current of the latest issues, for my work this is crucial”.

The PM has commented that the Quran application has given him a faster and more comprehensive understanding of the Quran. The MSC discussions have kept him in touch with issues and comments raised about the project. To the Deputy Principal Private Secretary, the application on Senators’ profile and the profile of MPs and state representatives have proved very useful. The P.M. uses this information as one of the main sources on which to base his selection criteria of these people. But, there are no tangible benefits. Further, the group has not been able to define the benefits that these impacts have on the users.

7.4 Case Studies

The third section of the chapter evaluates five applications from the P.M.’s Office. Users and developers consider two applications successful and have produced intangible benefits. One application is seldom used and no one can identify any benefits. The remaining two applications have yet to be developed. These applications provide the context of several experiments drawing on the proposed benefits management method.

7.4.1 Quran

Users and developers regard this application as successful. The researcher has selected it in order to affirm the benefits realisation model within the context of the activity of persuasion.
The Quran is the Muslim scripture, the primary source of Islamic teachings. It offers the rules and practices of Islam and a reference for all Muslims, as it touches every aspect of Muslim life. Hence, to understand the religion it is important to understand what is written in the Quran. Since the Quran is in Arabic, those who do not speak the language have to rely on translations. However, in Malaysia, the majority of the Muslims rely on the religious leaders for interpretation. The ability to cite verses from the Quran and to give its meanings is very highly regarded among the Malaysian Muslims. A person who is able to cite the verses freely is considered to be religious and knowledgeable in Islam.

The EIS group developed the Quran application in 1986 using IBM text retrieval software, Stairs. Users had access to it through their IBM 3279 terminals. The Prime Minister requested the application. In 1994 a client-server system replaced the IBM mainframe. This meant that all EIS applications, including the Quran application, had to be redeveloped using Powerbuilder.

The application takes all 114 chapters covering 6237 verses of the Quran. It has the Arabic calligraphy displaying the verses together with the relevant Malay translations. Access to the application is through the EIS main menu. A user wanting to find verses of the Quran pertaining to a certain topic needs to key in the request and the system will display the relevant verses and their translations. A user can also retrieve translations for a particular chapter by keying in the required chapter number or its title. A profile of each chapter is available as well. A user can print anything retrieved.

The main objectives of the application are:

i. to give easy and quick access to required verses
ii. to give quick and correct translations of the verses

The P.M. and his supporting personnel regularly use the application as citations in the P.M. speeches and writings. They use these verses and their interpretation as evidence to support certain ideas that are being promoted or explained. On average the P.M. accesses
the application five times a month. Looking at the utilisation data his usage especially
increases during election campaigns.

Before the development of this application, requests for *quranic* verses on required topics
and their translations were normally made through the Islamic Centre. The Islamic Centre
is a government agency responsible for the promotion and monitoring of Islamic policies
in the country. As such, it has a number of Islamic religious officers whose views are
often sought when it comes to religious issues. The response to the request usually took
some time as it involved another organisation and answers had to be confirmed through
manual searching of the *Quran*. Hence, it was impossible for the P.M. to get an
immediate response to certain requests that he made. With the manual search, it was
rarely possible to cite all the relevant verses. There were also no hard copy printouts of
the verses.

Speed is not the only advantage. The P.M. employs the application primarily to have a
greater understanding of Islam. This is not just because he is a Muslim, but equally
important because of the environment that he faces.

The Malays strongly adhere to Islam. Muslims in Malaysia generally feel that Islam
ought to be accorded a larger role in personal life and in the conduct of public affairs.
Hence, they require their leaders to be knowledgeable in the religion and their
government must implement policies that are not against their Belief.

The Malays who form 50% of the Malaysian population are respectful of religious
leaders and hold them in high esteem. These religious leaders are normally scholars who
have had formal religious education in either the Middle East or local religious schools.
The P.M. has received no formal religious education. Hence, religious leaders sometimes
question his authority on religious issues. There are certain sections of Malay society
who are not happy with the way the P.M. handles Islamic issues, even though they
admire his economic policies and his courage in international affairs.
However, the P.M. believes that some of the Malays have a narrow understanding of Islam. According to him, they do not understand the Qur'an fully and thus the true teachings of Islam. To him the "Quran speaks in parables, the real meaning of which must be interpreted in the context of the situation faced by the people through the ages. But most interpreters insist on the literal meaning of the words in the Quran." (Mohamad, 1985; pg.19). He has written; "the Malays have focused on only some of the Islamic teachings, neglecting others, particularly those pertaining to worldliness." (Mohamad, 1985; pg. 21). He believes that many interpretation of Islam do not acknowledge that it is a system of life and living that is wide and all encompassing. The Prime Minister has lamented, "Each time a project is launched to raise the standard of the Malays in various fields of knowledge, doubts about its effect on religious faith have hindered its success."(Mohamad, 1985; pg. 22). He finds this state of affairs regrettable, "one of the saddest ironies of recent times is that Islam, the faith that once made its followers progressive and powerful, is being invoked to promote retrogression...A force for enlightenment, it is being turned into a rationale for narrow-mindedness; an inspiration towards unity, it is being twisted into an instrument of division and destruction" (Mohamad, 1985; preface).

At the same time the P.M. has to face an opposition party, the PAS, which is traditionally known as the party of Islam. Before the mid 1980s the party supporters were mostly from rural Malay communities. However, since this time the party leaders have expanded their influence into urban centres and university campuses. In the 1995 election, the party won the state election in one of the eleven states in Peninsular Malaysia. The party leaders' success has coincided with its adoption of a more distinctly Islamic stance and a more combative religious idiom to attack the ruling party. In comparison to the P.M. most of the PAS top leadership have had formal religious education.

Even though Islam is constitutionally the official religion of Malaysia, more than 45% of its population are non-Muslims. In the wake of Islamic revival in the country, the PM needs to reassure the non-Muslims that the Islamisation programme will neither affect them negatively or that it signals the end of a secular state in Malaysia.
In the Muslim world, the Malaysian P.M. is a well-respected leader. He gives talks on Islamic matters at meetings and conferences. This compels him to prove that he is indeed knowledgeable.

The *Quran* application has been a useful resource for the P.M. Having no formal religious education, he uses the application to educate himself on Islamic principles and values. In this way he is better prepared to face issues concerning Islam. Backed by verses from the *Quran* he shows that his stand or solution on those issues are Islamically correct.

Convinced that the religious interpreters have narrow interpretations of the *Quran*, the P.M. feels that it is his duty to make the much-needed corrections and communicate these to the people. To do this he has to show explicitly that his reference is to the *Quran*. The nature of the Malaysian Muslims is that persuasion depends on reference to the *Quran*.

The P.M. realises that to influence the people, he has to persuade them that these ideas are not against their religion. To do this he has to prove to them that he understands the *Quran* very well. Hence, the use of the application to assist him in making his assertions about certain ideas and innovations.

To counter attack the accusations of the opposition party, PAS, and increase the popularity of his ruling party, the P.M. realises that he has to persuade the people that his party’s actions are not contrary to Islamic teachings. He has to show them that he really understands the Islamic principles and that PAS’s interpretation is too narrow. He tries to convince them that Islam is not just about rituals and appearances, but Islam is a way of life. At the same time he tries to point out to non-Muslims that the universalism of Islamic values are not inconsistent with other ways of life.

These benefits are real, not simply imagined. The P.M. himself has said, “It is easier to read the *Quran* and its interpretations through the computer.” It has given users insights into each chapter of the *Quran* and most importantly the translations have given the users understanding as to the contents of the *Quran*. This is achieved by the ability to query
certain required topic throughout the Quran. The query brings all related verses from the different chapters together. With this understanding, the P.M. has used the application in preparing speeches and writings which are more persuasive to his audience. The ability of the application to furnish the P.M. with all relevant verses pertaining to certain topic has enhanced his image among the people. It reaffirms his position as a Muslim leader. Newspapers constantly refer to the P.M. as a religious leader who relies on the Quran and is able to quote freely and aptly from it. His officers and cabinet colleagues have a high respect for his knowledge on Islam. One of his officers has suggested that the P.M. probably understands Islam better than the religious leaders who have formal religious education. A Malaysian writer (Othman, 1997) has observed that the PM has managed to change not only some of the Malays’ sensitivities on certain aspects of their culture but also on several religious dimensions.

Taking Neustadt (1960), the model hypothesised that an executive’s persuasive power is enhanced by his authority and status, good professional reputation, and good public image. Hence, an executive with these characteristics will be able to use the EIS application effectively in his persuading role. The P.M. by virtue of being the leader of the government is a man of authority and status. As the leader of a political party he has authority and status within the party. This authority and status as the party leader has helped him in making his arguments about the teachings of Islam accepted by many of his party followers. However, true to what Neustadt has written, authority and status alone does not guarantee that all his decisions and policies will be accepted by the people. This is especially in the issue of Islam where religious leaders have all along been a powerful force. His good reputation reflected by his concern of the welfare of his race, the Malays, make his arguments better accepted by the people. His conviction that what he is doing is correct and his courage to stand up for his belief make the ideas that he put forward agreeable to the people. Internationally his reputation as a leader of a developing Muslim nation wins him invitations to give talks at Islamic conferences and meetings. This has by itself given him the opportunity to enhance his reputation. Because of the close connection between political and religious authority in Malaysia, the PM has been able to use the system to establish a source of religious authority to complement his political authority.
Looking at organisational factors, centralisation of religious decisions and policies will logically support further utilisation of the *Quran* application. However, in Malaysia, religious issues are a state matter. These are under the jurisdiction of the respective head of states. This in fact forces the P.M. to be more persuasive in making his Islamic views accepted.

The application has simple retrieval method making it very easy for users to access without the help of any support personnel. However, what makes the application successful as a tool for persuasion is its comprehensiveness and the fact that it is verified. Every single verse of the *Quran* in the application was checked. This is important because the users do not understand Arabic. Hence, it is impossible for them to spot any errors. There are many on-line versions of the *Quran* which have several verses deleted or added to them. Knowing that the application is totally verified gives the users, especially the P.M. confidence in citing the information. Another important factor is that the application provides the very information that the P.M. needs to assist him to portray the image of a well-learned Muslim.

The application has been successfully used in a way that delivers its potential benefits, even though the P.M. has not seen the benefits as such.

### 7.4.2 BERNAMA News-on-Line

Users and developers regard this application as one of the most successful. The researcher selected it in order to provide a means of affirming the benefits realisation model within the context of the activity of learning as the *Quran* application affirmed the model in the context of persuasion.

Executives have had access to the BERNAMA news-on-line by means of the EIS since 1993. This is one of the two subscribed applications in the EIS. It is a stand-alone application. However, it has been adapted as a network application and integrated into the EIS. The main purpose for having the application is to give users the latest local and international news.
All EIS users have access to this general application. BERNAMA demonstrated their news service to the P.M. office in 1992. They had just established the service and had very few organisations subscribing to it. A group of three senior analysts assigned to evaluate the service recommended its incorporation into the EIS. They believed that the service would provide the most current news to the executives. However, like all other applications in the EIS, there was no cost benefit analysis done, even though the costs were clear as they were billed monthly. There was no attempt to identify benefits. The evaluation report described each category of news without going into how users would benefit. Analysts deemed it sufficient that the service would provide executives with the latest news. In fact, the IT management made their decision to subscribe immediately after the demonstration. The evaluation report was a formality. Cost had not been a constraint in the development of any other EIS applications and similarly had not been a limiting factor for the subscription.

The application has easy menu driven screens. Retrieval of information is simple, but there is no analysis. An executive can access any of the news item listed and if required, he can print them. As an on-line news service, screens are continuously updated throughout the day and the night. The service retains the information for a week. Since most of the news is published in the newspapers the following day, retaining information for a week seems adequate.

There are nine categories of information:

i. general news - refers to local, miscellaneous political or social events;

ii. communication and transport news - deals with events in the transportation industry;

iii. world news - covers events happening around the world. Most of the world news come from wire services such as the Associated Press, AFX-Asia News, Agence France, Asia Pulse, Reuters, and Kyodo World Services;
iv. Corporate news - concerns commercial and industrial affairs, for example restructuring of a company or the appointment of a company’s new CEO;

v. Economic and finance news - reports on the Malaysian stock market and occasionally gives statistics on the country’s economy;

vi. Commodities - carries the prices of commodities and other related news;

vii. BERNAMA Executive Report - special reports on important events or news either national or international;

viii. Finance and Banking - provides news on the banking and finance industry;

ix. Newspaper Summary - highlights the major news stories found in 19 different newspapers. These include national newspapers, regional newspapers and papers of the two main vernacular languages, Mandarin and Tamil.

BERNAMA news-on-line is the most utilised application after electronic mail. Executives use the service to keep abreast of recent happenings. The users are the P.M. and several senior officers in the P.M.’s Office. However, the most regular users are the Special Officer to the P.M., the Press Secretary, the Assistant Press Secretary, the Deputy Principal Private Secretary, and the Director of the IS Unit. They employ the service daily. Even though the P.M. is a prime target for the service, he uses it irregularly. On average he accesses the application three times a month. Unlike other EIS applications, regular usage is essential for it to be really beneficial as there is new information all the time. Some of the most frequent users have the application on their computer screen so that they can continuously monitor the news.

The P.M.’s Office has to be alert to all news. Of course, the P.M. and his aides have many sources of information, formal and informal. The BERNAMA news is one of the formal sources. There is plenty of information, even though not all of it is relevant. Before the implementation of this service, the executives only read the news the following day from
the newspapers. The P.M. has to be informed of urgent news immediately. There is no evidence that executives have used the information provided through the service directly in decision making. However, continuous scanning of the service provides some basis for understanding and learning about what is happening in an executive's environment. One executive commented: "I have not made any decision or taken any action based on the information I read. I read the news to keep me aware of what is happening."

Newspaper summary is one of the most highly used aspect of the service. Unlike the other categories, the currency of the information is not critical for this category. What is important is the availability of the various regional and vernacular newspapers. There are national newspapers, as well as regional papers, that are published and circulated only at regional levels. There are also papers of vernacular languages such as Tamil and Mandarin. What is useful is that the service provides summaries of all papers in either English or the national language i.e. Malay. Hence, executives can scan through the papers, irrespective of the language used and their circulation area. In a multi-racial country such as Malaysia, this is very important. Even though the news coverage is similar, different papers emphasise different aspects. The vernacular newspapers, spotlight events which are sensitive to their specific communities. For example, a Tamil newspaper will have more that is relevant to Tamils. A paper's editorial view reflects the community's view. This serves as a mechanism for continuous learning on what is important among the different racial groups. This understanding is essential to the P.M. and the officers supporting him as any policies or decisions made need to consider all these sensitivities.

The BERNAMA executive report gives users reports of local and international events seen from the perspective of the agency. Scanning through these reports gives executives alternative interpretations of events which may enrich their views.

The executives who are regular users of the application are among the more innovative group of officers. Personal and working experience with the Special Officer, the Press Secretary and the Deputy Principal Private Secretary suggests that they are always proactive. The nature of their roles and the character of the person whom they are
serving requires them to be innovative. In fact these characteristics are crucial for their selection to these posts. The Deputy Principal Private Secretary has a reputation for her entrepreneurship not only among the employees of the PM office but also among her colleagues in other departments. She has introduced several changes to the administration of the office and was responsible for suggesting a number of applications that are now part of the EIS. This group of users are also officers who are known to demand details and handle much information.

Looking at the organisation, socialisation is one of the factors that encourage the high usage of the service. The Press Secretary's use of the application has encouraged his assistant to adopt it. The author has observed meetings and informal gatherings in which recent news which was obtained from the application was discussed. This often led others to access the service, sometimes for the first time. The EIS group has promoted the application widely. It is frequently demonstrated as an effective example of an EIS application.

The application has also favourable features for learning. The information is current. The information comes from a multiplicity of sources and is well integrated, although there is no analysis. The retrieval system is simple.

The system has been successful delivering users its potential benefits. This is gauged not only through its regular utilisation, but from user feedback highlighting usage characteristics and its impact.

7.4.3 External Trade
Users and developers do not regard this application as successful. The researcher selected it in order to contrast it with the previous application, Bernama news. Since both applications fall within the learning category, the same factor should lead to the realisation of their benefits. Because one application has been successful and the other unsuccessful, a comparison should identify those features which differ. By this means the sources of failure of the External Trade application should be revealed.
The external trade application was one of the first components of the EIS developed in 1985. It is a pillar of the economic sector. External trade is an important application together with general economy, government finance, money and banking, price, and tourism. The objectives of the application are:

i. to provide users with the latest external trade figures
ii. to give the trend and the trading patterns of Malaysia's external trade

The original proposal to develop the external trade application stated that information on external trade was essential to the P.M.'s office. This is not only because external trade is an important component of the economy, but specifically, because the P.M. was chairman of various trade related committees and councils. Among them are, Malaysia Trade Council, Malaysia Business Council, Trade Sector Service Committee, and Foreign Investment Committee. The external trade application is to assist the P.M. and his officers in understanding Malaysia's external trade. This information is a reference for the P.M. and his officers. Even though there is already an external trade database in the Ministry of International Trade, the report argued that the earlier database was not suitable for the needs of the P.M.'s office. The Ministry's database was very detailed and the output was not suitably formatted. At the time, however, all trade-related information had to be requested from the Ministry and trade publications. The time required to prepare external trade information was unsatisfactory and limited. The report concluded that having an internal application as part of the EIS would give executives the flexibility to scan through the information with comparative ease. It would greatly enhance their understanding of the country's international trade situation.

Technical and design issues became the main focus during development. The data conversion required much effort and raised problems, most notably because the Ministry and the P.M.'s office used different computers. There was very little thought given to how the application might change some of the procedures or how executives would realise the benefits that had been cited in the proposal. On completion of the development maintenance of the system became the next focus.
The SQL/DS DBMS was the basis of the application. Intellect™ provided an easy query language, but SQL was also available. When the EIS migrated to a client server system in 1994, the developers selected Oracle and Powerbuilder as the main system software.

The application contains external trade figures between Malaysia and the rest of the world. It gives data on total exports, total imports, balance of trade and the type of imports and exports that Malaysia has with every country with which she trades. Every item records quantities and values for both import and export. Information is available for each quarter for the last five years. This enables executives to observe trends.

Access to the application is through menu-driven screens. Executives can retrieve information by year, by country or group of countries (e.g. European Union, Asean) and by commodities or group of commodities (e.g. food, manufactured goods, chemicals and related products). Analysing the application, there is much information. It provides the understanding of Malaysia's external trade positions and the trends throughout the years. It highlights imports and exports that have significant impact on the balance of trade. It also focuses on Malaysia's important trading partners and emphasises the historical information for any selected country.

The P.M.'s office uses the application as a reference when dealing with foreign countries through such events as the P.M. visits overseas or the visits of foreign dignitaries to Malaysia. No one envisaged this use of the external trade application when it was proposed. This may be because it was not only in the late 1980s that the P.M. began to lead trade missions overseas. For most of the missions, the P.M. needs background information on trade activities between Malaysia and the country concerned. The application gives him the knowledge and understanding which guides him in his talks and meetings with his counterparts. This is an example of Mintzberg's monitoring and spokesman role. The P.M. receives information that enables him to understand what is taking place and helps him to detect problems and opportunities. He then disseminates some of the information during his interactions with trading partners. Similarly, the P.M. uses the application during visits of foreign officials to his office. The EIS group
publishes the relevant information in brochures and pamphlets which are distributed during visits.

However, executives rarely use the external trade application for its original purpose. Analysing the utilisation, it is clear that it heavily coincides with either the Prime Minister’s overseas visits or visits from other foreign officials. Executives do not seem to scan it regularly. This suggests that the application is rarely used as a base for learning of the country’s external trade activities. Hence, its benefits are limited.

The P.M. and his senior officers were the target audience initially. The P.M., however, has rarely utilised it directly. For the past five years, he has only accessed the external trade application twice. His use is always through the support staff who were directed to print specific information as required. The employment by other officers has also not been very satisfactory. From 1995 to the middle of 1997 there were only 93 accesses by all potential users of the external trade application. Only one or two officers use it consistently. Before the migration to the client server system, users had commented that the application was difficult to use. The query language was not flexible and the SQL queries were too complex. However, the improvement brought about by having access to the system as menu-driven has not brought much changes. The officers who use the application are junior. Thus, the employment of the application as a base for users to increase their understanding of the country’s external trade has not been realised.

The EIS group reviewed all applications in the office before the system was changed from the mainframe to the client server system. The users rated the importance of each application. They found external trade useful. One comment from a senior officer was, “the external trade application is very important and should be retained in the new system. It gives me great confidence just to know that it is there whenever I need it.” There were also adverse comments made of the system. Another user commented, “I can easily phone someone at the ministry and get all the information I want, the data is more current.” Despite this and the low utilisation rate, there was agreement that the application was necessary. However, there was no attempt made to analyse why a seemingly interesting and useful application had such low utilisation. It was largely
believed that people were put off by its relatively complex queries. Hence, it was assumed that the new and easy retrieval system brought about by the changeover to a client server system would improve the situation.

The target group for the application are the same group of executives who are using the BERNAMA news-on-line service. They are the executives who assist the P.M. in all the trade-related committees that the P.M. chairs. Understanding and having a thorough knowledge of the topic will thus make them more effective in carrying out their roles. However, they are not regular users of the application.

The EIS group does not demonstrate the external trade database to new users in their early training sessions unless the users asked for it to be shown. Historically, this was because of the early complexity of the interface. No one wished it to discourage potential users. Even though improvements were made to the application, the condition remains the same. An officer interviewed in the study still thinks that she has to key in long queries to access the external trade information. The EIS support group does not feel very comfortable in promoting the application even though the members are convinced that it is very beneficial. Further queries indicate that being a technical group, the EIS support group felt very inadequate when asked to train users in using the trade database. The support group differs from the developers. The developers may have a little bit more knowledge on the topic, acquired during the application’s development. Members of the support group are not always able to answer questions posed by users. Socialisation has not been able to assist in realising the benefits as the users are mostly junior officers and hence have very little influence. The officers’ roles may also be a constraint to their use of the application. Their busy schedule leaves them very little time for scanning activities although the complex and unstructured nature of their roles means that they should be good scanners.

Looking at the system’s features, the application provides a very simple retrieval method. The menu-driven queries enable users to easily access the information. However, being menu-driven, the flexibility in analysing the trade figures is somewhat limited. The application presents information only in tabular formats, making analysis on trends and
patterns difficult. The flexibility in analysis available in the previous system has been replaced by a relatively rigid predefined output. In terms of differentiation, the score is also not very high. The information is not very current as the updates are quarterly. The application only provides trade information between Malaysia and the other countries. There is no information on the external trade of other countries, especially those within the Association of South East Asian Nations (ASEAN) that can be used for comparison.

7.4.4 Comparison of the BERNAMA news-on-line and the external trade system
Analysing the BERNAMA news-on-line application indicates that most of the success factors to using the application for learning as hypothesised in the learning realisation model are present. The benefits realisation model does explain the existing level of satisfaction. This observation tends to agree with the previous studies of Markus (1983), Kraemer (1993) and Vandensboch and Huff (1997). The regular users of the application have characteristics that are positive to learning as hypothesised in the model. They are innovative, receptive to all types of information and can deal with complex information well. Organisationally the EIS support group has promoted the application well. There is no lack of training for the application. Executives are very well aware of its existence and its potential benefits. Socialisation reinforces training. Some executives start to use the application after learning that their friends have access to the most current news through the application. The job characteristics which are largely unstructured may also encourage the application scanning as it covers a wide variety of topics. Looking at the technical features, BERNAMA news-on-line contains a wide variety of information coming from a multiplicity of sources and which continually changes. It integrates various local and international news, views from different newspapers, and special reports on important issues, thus providing the integration factor.

The presence of all these factors in the regularly used BERNAMA news-on-line application has only affirmed the benefits realisation model for learning. It does not indicate any degree of importance to any of the factors. It is not possible to suggest social influence or user support or any other factor as the most influential factor in encouraging the executives to use the application. However, external trade application, adds several possible insights to the analysis.
The study on the external trade application has shown that the application has not been successful. Although the application was developed much earlier than the BERNAMA news-on-line, executives have rarely used it. An examination of those who have access to the application reveals that most of them are the same executives who have access to the BERNAMA news-on-line service. Yet they do not make full use of the external trade application. The P.M., for instance, has all the user characteristics proposed in the realisation model for learning. He is always recognised as an innovator. There are many examples of this. He was responsible for the national car project which has proved successful in the past few years. The more current innovative idea is his multi-media super corridor (MSC) project which is slowly taking shape. He is a thinker and a natural scanner. Despite all these positive characteristics, he has hardly use the external trade application. Although executives who lack the predisposition to learning seldom use either applications, the analysis suggests that favourable user differences alone are not sufficient. This is similar to the findings of Vandenbosch and Huff (1997) who found that a predisposition toward scanning behaviour is a necessary condition, but not a guarantee to successful EIS scanning. There must be some factors that make external trade a less attractive application.

Looking at user support, it is clear that there is much more promotion for BERNAMA news-on-line than the external trade. Training for the latter is mostly on requests, and there are few requests. The demonstration of BERNAMA news-on-line, on the other hand, is central to every training session. As described in the case studies, this is largely because the EIS support group finds it easier to explain the contents of the BERNAMA news and demonstrate its benefits than that of external trade. To promote external trade application effectively, the EIS support group must have some knowledge of the subject and the terminology. Their technical orientation causes them to ignore this. As the application is rarely used by the executives, socialisation has not been a factor. Applying the job characteristics factor in the case of BERNAMA news-on-line suggests that the unstructured and ad hoc manner may have been one of the causal factor for the BERNAMA news scanning, but this does not seem to hold true in the case of external trade. Looking at another aspect of job characteristics, that is the work schedule, the
experiment suggests that those executives with tight daily schedules will be less likely to scan through the application. Taking the P.M. as an example again, despite exhibiting a predisposition towards learning and having access to the BERNAMA news-on-line service, his use of the service is only minimal. Studying his work schedule and interviewing him revealed that his time is limited. This is a plausible reason since regular scanning requires executives to spend some time going through the application. Executives whose schedule is always full will find it difficult to find the time to scan through the applications.

Studying the technical features also reveals that, external trade application has less favourable features than the BERNAMA news-on-line. BERNAMA news-on-line clearly demonstrates differentiation. Vandenbosch and Huff (1997) have concluded that differentiation is not an important success factor. Adding more varied information will not encourage the EIS scanning. However, the experiment with BERNAMA news-on-line seems to suggest that this is a significant factor in the success of the service. The lack of this may also be one of the important reasons for external trade to be ignored by the executives. The external trade data is three months old and the scope of the information is relatively limited. The application does not include projections and forecast figures and comparisons within countries of the same regional grouping is impossible as there is no such data in the application. An executive might increase some of his understanding of the country's external trade, if he can relate the increase and decrease of the trade figures with certain new policies or control measures introduced by the government. Hence, integration of the application with other pertinent applications and issues is useful. At the moment, the application does not have any linkages to any other applications. Flexibility which is found to be an important technical feature in Vandenbosch and Huff's study, is also lacking in external trade. Unable to put the figures into some charts or graphs where trends are easily seen and understood, may have discouraged some executives from using the application.

All these seem to indicate that organisational and system's characteristics are very important factors in realising benefits from learning applications. The experiment thus indicates that user characteristics of innovativeness and tolerance of ambiguity are an
important basis for users to benefit from learning applications. However, without sufficient promotion and training, social influence and some available time, the benefits of these applications may not be fully realised. Available time becomes a crucial factor for busy executives. The application itself, if it lacks flexibility, differentiation and data integration will not attract scanners.

To increase the possibility of delivering the benefits from the external trade application, the researcher suggested the following changes:

i. One of the solutions proposed was for the support group to play a more proactive role. The group may act as filters, scanning and presenting the information to the users. The group has implemented this alternative. This allows for more help to executives with little time. The results, however, did not show much improvement. The result is limited as the group lack the capabilities to analyse the data.

iii. Another undertaking was to make the EIS support group more proactive in their promotion and training. The group must not wait for the executives to request for training, but promote the application widely by highlighting the benefits that it can potentially provide. The author has taken this step and promoted the application to the Special Functions Officer to the P.M. who thought that the application was still using the old interface. The immediate result was the utilisation of the application by the executive.

iii. This is related to the group’s understanding and knowledge about the topic. The inclusion of a subject matter expert in the group is now under consideration.

iv. To train an executive who can be a catalyst in influencing other executives into using the application. The Deputy Private Principal Secretary has agreed to this role.
v. The application itself needs some enhancements. The strictly tabular presentation needs to be complemented with some graphical charts emphasising trends and forecast growth. This is being looked at as the present software has the capabilities. This was not considered before since the developers argued that even with simple tabular presentation, users have rarely used the application.

vi. Quarterly updates of the information may be improved with some projected trade figures. Although the data is not confirmed, it provides users with some useful information.

vii. To increase the usefulness of the information, it was suggested that the EIS group should look into having external trade figures for countries within the ASEAN countries. This will provide valuable knowledge and allow users to make informed comparisons.

7.4.5 Decision tracking and Electronic meeting

The applications are extensions to the applications available under the communication management component of the EIS. Having established the electronic mailing and faxing system, the diary system, and the calendaring and scheduling system, the EIS group identifies electronic meeting and decision tracking as further applications which would enhance the efficiency of the office. This is also in line with the electronic government project that is being promoted throughout all ministries. The budget for the applications comes from the yearly expansion programme of the IS Unit. At the time of study the systems have been approved. The IS Unit decided not to develop the systems in-house. As such the office is preparing a tender document calling for total solutions of the two applications. The tender document will contain the objectives of the two systems together with the functionalities that the systems must have. Discussions with the IS managers of the office revealed that vendors who can provide all the functionalities required will be shortlisted. The shortlisted vendors will then have to develop small prototypes and demonstrate them to the selection committee. There are two committees set up for these projects. One committee, the steering committee, looks into the management aspects of the projects, defining the requirements. Another committee is the
technical committee which evaluates the technical capabilities of the proposals. The steering committee will make the selection. The chairman of the technical committee is also a member of the steering committee.

In the case of the electronic meeting, the P.M. office has on several occasions arranged for video conferencing facilities for the P.M. Hence, with the electronic meeting the facilities will always be available when required. The report proposing the system has defined the system’s objective as a way to improve the effectiveness and efficiency of personal and workgroup communication.

The P.M. is to be the main user of the system together with all the senior officers in the office. With the application developers envisage that travelling time for attending meetings will be reduced, and the communication boundary will be extended, where there is no location, distance and time limitations. Besides these, there is no mention of other benefits that the system will have on either individual user or the organisation as a whole. However, the system’s proposal include a list of technical features which the system must have. The features required for the system are:

i. Internet phone - to enable point-to-point audio conferencing over the Internet or corporate Intranet, allowing voice calls to be placed to associates around the world;

ii. Multipoint Data Conferencing - allows two or more people to communicate and collaborate as a group in real-time over the Internet or corporate Intranet. It enables users to work together by sharing applications and exchanging information;

iii. Application sharing - it enables users to share a programme, allowing them to see the same data or information. It allows applications to be shared transparently without requiring any special knowledge of conferencing capabilities;

iv. Shared clipboard - allows a user to exchange the contents of the clipboard with other participants in a conference.
v. File transfer - enables users to send a file to a specific person or all the people in a conference;

vi. Whiteboard - a multi-page and multi-user drawing application that enables users to sketch diagrams, organisation charts, flow charts or display other graphic information with other people in a conference;

vii. Desktop video conferencing - allows group of people and individuals in different locations to hold interactive meetings.

The objective of the decision tracking system is to provide a common formal communications mechanism which will enable key people to track the implementation of government decisions. It should promote collaboration among executives, increase their efficiency and effectiveness, and cost-saving workflows.

The technical features of the system are to be:

i. the ability to display a short synopsis or extract for the user to browse, prior to opening or selecting the document;

ii. the ability to drill down into the source document to read the detailed information;

iii. the ability to access historical information stored in the decision tracking system;

iv. the ability for all users to access the decision-making solution from anywhere within the government networks;

v. the ability for access to particular decisions to be restricted to a series of users and/or group;

vi. the ability for discussion groups to be password-protected to prevent unauthorised access to sensitive information;
vii. the ability for members of the decision tracking system to be automatically notified when a particular decision tracking database has received a new posting.

The justification for the two systems was that they will increase the efficiency of the P.M. office. The proposals also conform to the electronic government initiative promoted by the government. One of the objectives of the electronic government project is to improve information flows and processes within government and in the process improve the speed and quality of policy development, co-ordination and enforcement. There were no identification of other potential benefits or how the systems would actually affect the potential users. The EIS group intends to evaluate vendors' proposals on the basis of technical capabilities. However, the researcher argued that having the technical features need not necessarily mean that the system will be implemented and used effectively. The best system demonstrated may not be the right system, may not deliver the right benefits to the office. But if EIS group identified benefits, they would be able to use these benefits as the basis or guidelines for ensuring that the systems implemented are focused on delivering the promised benefits. Vendors would know what they are expected to deliver. The researcher also argued that the systems' success were not only dependent on the systems' features and capabilities but also on the users and their environment. Changes and adaptations may have to be made to encourage the effective use of the systems. These facilitating factors will be difficult to define without knowing the actual targets or benefits that are to be realised.

The benefits management method proposes the use of a framework of theories of executive work and the EIS benefits model to justify the development of EIS applications. An electronic meeting system clearly indicates group activity. Looking at the objective of the system which emphasises efficiency in workgroup communication and analysing the system's features of information sharing and interactive meetings, the researcher concluded that the system would primarily address the sensemaking activity of executives. Users can use the system to disseminate ideas which they have gathered or have an interactive discussions on certain pertinent issues. Learning is possible through the exchange of experiences. Linking the electronic meeting system with sensemaking activity indicates the area of executive work which will be potentially affected and
enhanced and gives a set of potential benefits of the system. Here, the potential benefits include improved sensemaking activities of action, affiliation, triangulation, deliberation and contextualisation. There are also the benefits of shared vision and improved communication.

Analysis on the proposed decision tracking system indicates that despite its name the system is not to track or monitor decisions. The system is for certain selected executives to discuss important issues before making any decisions. They will input their views and get feedback from others in the group. The elements of collaboration and communication emphasised in this system indicate that it involves group activity and in this case group learning. Hence, it was concluded that decision-tracking system is also a sensemaking application.

Even though the systems have been justified, the group agreed that using the models of executive work and the EIS benefits model would have made their justification more objective and concrete. The benefits model would show that the system will have the potential to deliver the benefits of higher performance and enhanced reputation. They would be able to highlight the EIS features and the capabilities and mechanisms which would lead to the outcome and final benefits.

Nevertheless the potential benefits of the system will be used as guides for its implementation and as evaluation criteria at the end.

7.5 Summary

In the process of formulating the EIS benefits management method, the researcher had introduced a number of concepts. To ensure applicability of the concepts in the Malaysian government she tested these within the affected organisations. This chapter reports on the findings from these studies. The next chapter will analyse these results within the philosophical approach adopted for the study and describes some of the supplementary findings that have resulted from the study.
CHAPTER 8:

ANALYSIS

8.1 Introduction
The study has formulated an EIS benefits management method. The primary objective of this research is then to affirm the utility of this proposed method. Experiments were conducted to test the method's utility, testing the various concepts that have been introduced. This chapter discusses the findings from these experiments. The analysis is done within the framework of the tests that have been laid out in the research method chapter. It looks back at each step of the proposed EIS benefits management method analysing the identification, the selection, the implementation and the evaluation steps and reviews how each of them meets the criteria that has been set up. This then leads to the affirmation of the method and the discussion of how the proposed method overcomes the problems of existing benefits management methods. Further, the chapter analyses other findings of the study in an effort to offer generalisations for theories, concepts and principles underlying the proposed EIS benefits management method. These include the generalisation of Mintzberg's managerial roles, executives' use of EIS, uses of EIS, implementation issues of the EIS benefits management method and the concept of evaluation as organisational learning.

8.2 Affirming the utility of the proposed EIS benefits management method.
Chapter 5 has laid out four criteria in order to evaluate the utility of the proposed EIS benefits management method. First, are the instruments or tools useful? Is there a warrant for the techniques? Do the techniques result in interpretations infused with meaning? Do the techniques frame the problem in such a way that it can be solved? Do the technique promote a response from the situation? Do the techniques keep the inquiry moving? Second, do the experiments lead to expected and desired outcomes? Third, do the techniques deal with breakdowns in conversation? Fourth, do the experiments lead to organisational learning? The affirmation of the proposed EIS benefits management method’s utility will be analysed within the framework of these criteria.
8.2.1 Identification of experiments

The first step of the proposed EIS benefits management method is the identification of projects or experiments. For this step the method adopted the technique used by Belcher and Watson (1993) in their assessment of EIS in Continental Oil and Transportation Company, Conoco. Is there a warrant for using this technique?

Belcher and Watson developed the technique in order to evaluate the value of EIS in Conoco. The objectives of the evaluation were to: identify users of the system; identify user requirements; identify and eliminate low-value applications; identify applications that should be enhanced or added. These objectives are similar to the objectives of the identification step of the proposed benefits management method. The objectives of the step are to identify the applications, to identify the active and inactive users, and to identify those applications that were frequently utilised.

The technique in Conoco evaluates a portfolio of applications. There are seventy-five applications in total and hundreds of screens. Likewise the proposed method is also portfolio based. The method is to study all the EIS applications available in the organisations, namely the P.M.'s Office, the Ministry of Agriculture, and the State Secretariat. In total these three organisations have 50 applications with hundreds of screens.

In formulating the technique, Belcher and Watson have used several principles and evaluation concepts derived from the IS evaluation literature. They incorporated a variety of benefits into the evaluation as proposed by Dixon and Darwin (1989). They included the intangible benefits as these exist with decision support-oriented applications (Malone and Wharton, 1984). They looked at each EIS application, measuring benefits at the lowest logical level. The technique adopted both quantitative and qualitative method attempting to quantify as much of the benefits as possible.

The technique is very detailed and systematic and is documented step-by-step. The usage statistics gave utilisation data of the applications. The analysis revealed which applications were being used, the users and the frequency of use. The utilisation data was
complemented with interviews. The interviews indicated the benefits that users were getting from the applications, both tangibles and intangibles. The usage statistics and the interview data were used to prepare application reviews for each of the application. The reviews provided a basis for analysing all of the applications. It gave important details of the applications. These details included number of users of the system, frequency of use, and perceived benefits of the system.

The technique was successfully used in Conoco. The process met all the objectives that were initially established and was accepted by Conoco's management as being thorough and objective. Conoco gained several valuable lessons as a result of this evaluation. It gives Conoco greater awareness of the system's current and potential value. It shows that a meaningful analysis is possible only by analysing each type of benefit at the organisational level rather than measuring the output before and after EIS implementation. It renews interest and support for the system and it identifies applications that should be enhanced or added as well as those that should be eliminated. Based on these and the fact that the step has similar objectives with Conoco's evaluation the technique is suitable for the study. Belcher and Watson (1993, p.240) have said, “The evaluation approach is generic and should be applicable to other organisations with an EIS”.

To make the technique more appropriate for the study there were a few amendments made especially to the questionnaire. Through discussions with organisational members a few questions were deleted and new questions were added to suit the type of users interviewed. As an example in interviewing the P.M. the researcher added at the outset general questions on IT. This then led to other more specific questions. The researcher also designed additional questionnaires for the interviews with the development group and the support group.

Through the interviews and discussions, the technique was able to enquire about the utilisation and the perceived benefits of each of the applications. The interview with the P.M. gave an insight into his views of the applications and IT in general. It gave an
answer as to why he is not able to use the EIS more frequently and some suggestions of how the applications could be improved.

Employing the technique the researcher was able to identify a portfolio of EIS projects from the three organisations in the study. The quantitative and qualitative approach of the technique enabled her to identify the users, their utilisation rate and the perceived benefits of the identified applications. It is easily modified and could incorporate new ideas and concepts as required by the situation. The output of this study meets the objective of the step which is to identify a portfolio of projects under the EIS.

However, there are also certain aspects of the technique which could not be adopted in the study. One of them is the cost benefit analysis of the applications. During the experiment, it was realised that it would be very difficult to get the information to estimate the cost benefit analysis. The secretary-general of the Agriculture Ministry has said, “The system has reduced my time looking for information, some applications have increased my understanding of certain topics, but to put a value to all these applications, it is very difficult.” This inability however, has not really affected the identification step. The objective of this step is mainly to identify the applications and generally assess the benefits. It is not aimed at evaluating the value of each of the application. Another problem is that there are no usage statistics from the Ministry of Agriculture and the State Secretariat. The researcher overcame this by interviewing the users and those in the development and the support groups for estimates of utilisation. This was quite easily done as the number of users in both organisations are small.

The method used in carrying out the selection step gives the three organisations a formal technique of reviewing the applications. It provides valuable feedback to the IS group as to the applications that are useful and the inadequacies of some of the applications. It confirms their views as to who are the active and inactive users. It triggers an interest among the users to look further into the applications which they have not been using.

The Conoco technique with the modifications mentioned above would be sufficient if the step needed was only to identify the applications. However the step also incorporated the
need to categorise the EIS into the various executive roles. Hence, a major addition to the technique was the incorporation of the theory of executive role. Based on the theory, the identified EIS applications were classified into various categories.

**The Taxonomy of executive work.**

Very few EIS studies have looked into executive work in order to understand the contribution or the role of EIS. None has looked at EIS benefits in terms of executive work. This study explores and tests the utility of the executive work theory as a theoretical concept that underlies the EIS BM method. The theory was applied in categorising the identified applications and the benefits identification stage of the proposed method. The taxonomy of executive work plays an important role in categorising EIS applications. As different categories of applications have different benefits, it is important at an early date to identify the type of executive activity an EIS application is to support.

The literature review on empirical studies of the nature of executive work concluded that Mintzberg’s managerial roles were the most plausible and had the greatest supporting evidence. Mintzberg’s (1973) work has been acclaimed in the literature as the most comprehensive study on managerial roles. An examination of the literature concerning theories of executive work identified six classifications. Mintzberg’s roles can be mapped onto these six categories reasonably precisely. The result is the taxonomy of executive work. Chapter Two has demonstrated how this amalgamation of the empirical and theoretical views of executive work was constructed.

But are these categories relevant to Malaysian government? The first phase of the study tested Mintzberg’s categories within the Malaysian public service. The results as discussed in Chapter Seven demonstrate that these six categories are applicable.

The six categories of the theory of executive work were affirmed in the study. It has shown that the categories are applicable. The executives in the study spent their time understanding and learning the environmental factors that affect their organisations. In all the three organisations this role is very valid. In the P.M.’s Office, for example, the
executives have to be alert at all times as to the happenings in the environment. Scanning the environment is an important executive role in the office. An EIS, which can provide the information, will thus be very beneficial. As a group executives try to make sense of these factors. Many of the scheduled and unscheduled meetings were used to get information, both internal and external that matters to the organisation. Weekly cabinet meetings held in the office are examples of these. Discussions were held to talk on complex issues. As executives they can not get away from the task of decision making. In this process information is gathered in the process of searching for the most satisficing alternative. In a group, decisions are reached through bargaining activities. Information is vital in these processes. The study confirmed that implementation is another vital role of executives. This is carried out either through commanding or persuading. These two activities map with the interpersonal roles of Mintzberg. The study suggests that executives spent more than half of their time performing these roles. The study also suggests that persuading is a more frequent activity than commanding in all the three organisations.

The framework gives the EIS stakeholders a better understanding of the nature and scope of executive work. There has been no attempt to relate the different views of executive work. Discussions on executive work during the study always suggest that executives plan and make decisions. Presenting the taxonomy really gives an education to this group of people. Evidence from the experiments has shown that the EIS stakeholders (EIS users, EIS developers, EIS support group, IS managers) accept the rationale in linking EIS benefits with executive work. Describing the role of information in each classification of executive work provides the stakeholders the framework within which to analyse current and potential EIS applications. Analysing executive work improves the understanding of how EIS can be of benefit. Knowing the activities that they undertake makes it easier for EIS developers to align the applications.

The problem at this stage is to identify how an application supports an executive activity. The taxonomy gives a clear description of the various activities of executives. It describes the work of executives as individuals and as a group. It describes the role of information in these activities. As such it is not difficult to see how an application
supports an executive activity. Knowing what the applications offer, the framework was able to guide what kind of executive work each system supports.

The researcher was able to categorise all the EIS applications within the six categories of executive work. None of them fell outside the categories. This affirms the utility of the theory of executive work in classifying the existing EIS applications. However, there are certain categories of executive work, which do not have any corresponding EIS applications. This shows that there are many more potential applications, which can be developed in the three organisations.

As there are six categories of executive work, the taxonomy gives a very good guidance as to the type of support the applications can provide. It provokes the IS group into thinking of other new applications which can be of help to the executives.

This technique of categorising the EIS applications also promotes a discussion about what effect each application has on executive work. It provides a basis for how the applications can assist executives in carrying out their roles.

In categorising the EIS applications in all three organisations, the researcher found some difficulties in some applications. The problem was due to the fact that some of the applications could fall within more than one classification. For example, the application on the parliamentary questions and answers could either be categorised under persuasion or learning. Looking at the objectives, the application is to help users to browse through the type of questions raised over the years and the nature of answers given. Taking this the application would be categorised under learning. But at the same time, it is also aimed at supporting the users in giving consistent answers to similar questions. This would portray consistencies in government policies and raise its credibility. This would then put the application under persuasion. Examining the application further, it was decided to put it under persuasion. This is because the real objective of browsing through the questions and answers is to pick up important facts and figures that were given earlier in order not to give conflicting answers. Hence the problem was solved by examining what really is the impact of the application on the organisation and the users.
The process of categorising EIS applications into the various classifications of executive work revealed that there are several aspects of executive work that have no corresponding EIS applications. The process shows that most of the applications are addressing only a limited scope of executive work. This reveals to the IS group that there are many more areas of executive work that have not been addressed.

8.2.2 Examining selection of experiments

The identification step has listed seven applications in the state secretariat, ten in the ministry of agriculture and thirty-three in the P.M.’s office. However, only five EIS applications were selected in the experiment. Two principles were used as a basis for the selection. First it must maximise the aspects of the method which are tested. Second the experiments must be feasible to conduct within the constraints.

The applications chosen had a combination of successful and unsuccessful applications, applications related to different categories of executive work and applications that are already in use and those that have just been proposed. The experiments selected as seen in the previous chapter were the BERNAMA news, the external trade system, the Quran application, the electronic meeting system, and the decision tracking system. Evidence from the experiments has shown that the Quran application focuses into the aspect of persuasion and the factors that support its beneficial use. BERNAMA news on the other hand looks into the learning category and the factors that encourage its utility. The external trade application explains the reasons that hinder the realisation of benefits under the learning category. While all these three applications are ongoing projects, the electronic meeting and the decision tracking applications tested the applicability of the method for projects at the justification stage. Hence, with these five applications most aspects of the method were examined. Except for satisficing, all categories of applications available at the P.M.’s office were tested. These include both successful and unsuccessful applications and cover projects that are in use and those that are in the justification stage.

The technique used here is based on utility of maximising the variety of the experiments. Ideally at least one application from the satisficing category should be selected. However, within the time constraint faced by this study, only these five applications were chosen.
The five applications were only from the P.M. office, as selecting applications from the State Secretary or the Ministry of Agriculture would have required a considerably more time.

However, this approach is not recommended for an organisation to follow. The approach here is taken as there are several constraints in this particular study. First, time is a constraint. Being a PhD research there is a time limit in which this study needs to be finished. To select more applications would take a much longer time. A much better approach would be for an organisation to select applications from all categories. Both heavily utilised and under utilised applications from each category should be selected as these would reveal the factors that lead to the differences.

Given the constraints of this study, the technique used in selecting the experiments has produced expected outcomes. The study was able to get an insight into the factors that lead to the utilisation and the non-utilisation of applications in the learning category. This is important as most of the applications are under learning. At the same time it looks into applications that have just been justified. This provides an opportunity for the researcher to affirm the utility of the method for applications that are at an early stage of development.

8.2.3 Affirming the experiments
In conducting the experiments the study employed three different concepts, the theory of executive work, the EIS benefits models and the benefits realisation models. To affirm the experiments we have to evaluate these three concepts in terms of the four criteria mentioned earlier.

8.2.3.1 Theories of executive work
The theories have already been discussed under paragraph 8.2.1

8.2.3.2 EIS benefits models
The EIS benefits models as shown in figures 3.7 to 3.12 of Chapter Three shows the association of executive work to potential benefits that could be obtained. The EIS
benefits model is central to the benefits management method because it identifies the potential benefits of all types of EIS applications. It indicates organisational variables that are involved in the process of realising potential benefits. These causal models describe the capabilities, the organisational mechanisms, behaviour, outcomes, and benefits resulting from the introduction of EIS. The models were applied in the benefits identification stage of the proposed method.

These models are drawn up based on the information processing theory of organisations supported by a number of studies of the relationship between information use and organisational performance. This gives strength and credibility to the models.

The model suggests that there are two benefits of an EIS. These two benefits are higher performance and enhanced reputation. The model indicates organisational variables that are involved in the process of realising these two potential benefits.

The model of cost reduction suggests two features of an EIS that are essential to realising this outcome. These are improved information and easy to use interface. The combination of these features provide a new organisational capability which allows executives to accelerate the speed of absorbing and processing information, making it easy for them to focus quickly on problem areas. The mechanism for this is the daily performance reports highlighting exceptions. This may results in the flattening of the management hierarchy. A case demonstrating this is Zeneca (Work, 1997). The EIS in Zeneca provides daily statistics on operations from any of its plants around the world highlighting discrepancies between planned and actual figures. As a result the Director of manufacturing in England no longer requires reports at country and regional levels. Zeneca has since restructured its manufacturing division removing these two levels of management.

The causal map of responsiveness as shown in figure 3.4 was drawn based on empirical studies such as Thomas et al. (1993), Zajac and Shortell (1989) and Smith et al. (1991) in the American Hospital industry. These studies show that an increased responsiveness towards patients’ requirements results in enhanced performance through improved asset utilisation and increased market share. Similarly Smith et al.’s study of the domestic
American airline industry found that a high level of responsiveness to customer demands is correlated to higher profitability. Bourgeois and Eisenhardt's study (1988) of six microcomputer firms shows similar results. The organisational capabilities, mechanisms and behaviour which lead towards responsiveness are again based on empirical studies. Eisenhardt found three mediating processes contributing to responsiveness. These are confidence to act, accelerated cognitive processing and smooth group process.

The model of depth of understanding starts with EIS features of an easy-to-use interface, improved information, and modelling and simulation capabilities which create an accelerated cognitive processing capability and increased participation in an organisation. Executives may adopt these capabilities to increase analytic comprehensiveness by examining multiple alternatives simultaneously as well as by considering a wider range of variables. It also allows better integrative responsiveness by improving the mechanisms for integrating decisions. These various mechanisms may lead towards more comprehensiveness in an organisation's decision making resulting in a deeper understanding of the problem and its consequences. Again these organisational capabilities, mechanisms, and behaviour are constructed based on empirical studies such as Frederickson's (1984), Eisenhardt's (1989) and Bourgeois and Eisenhardt's (1988). These studies demonstrate a strong positive correlation between the comprehensiveness of an organisation's decision making process and its performance.

Using these models in the experiments has helped the researcher in exploring the possible outcomes and benefits from the current EIS. The study has affirmed that the benefits models guide the study into interpreting EIS benefits in a new light. Identifying benefits and planning for benefits realisation were facilitated with the models. These standard benefits models give the organisation (P.M.’s office) for the first time a new way of looking at the EIS applications. Before, the EIS was only looked at as providing fast and easy access to information.

The proposed EIS BM method also provides a framework for discussing EIS benefits. The EIS benefits model provides a causal framework on how the EIS technology can be utilised to achieve its potential benefits. Each category of executive work may invoke a
different component of the EIS system and following the causal model it shows the outcomes which may occur at the different stages and the final benefits. This will not only facilitate the identification of benefits for new applications but current applications can be evaluated as to the potential benefits that have not been achieved. For example, the electronic-mail application which is currently available in all the three organisations. Looking at the benefits model sensemaking application would result in better triangulation, contextualisation, action and deliberation. The end benefits will be higher performance and enhanced reputation. At present, the application has not been much utilised in such a way as to achieve these results. Many of the executives use it for informal communication and have not taken it as a serious communication tool. Conscious efforts can then be taken to rectify this.

Applying this model has shown that benefits are viewed differently by different people. During the interviews, the users and even the IS group have quoted that easy and quick access to information as the benefits of EIS. From the model, these are only the features of EIS, not the benefits. The model gives the users and the IS practitioners the framework to think more seriously about the impact of this easy and quick access to information and the impact of EIS as a whole.

8.2.3.3 EIS benefits realisation models
The EIS benefits realisation model allows IS practitioners to manage the implementation of EIS benefits. It focuses on the critical success factors that are required for the realisation of the expected benefits. These critical success factors are grouped under three categories namely, user differences, organisational context and system characteristics.

The user, organisational and technical factors that the method proposed as three critical factors for successful EIS use is based on the literature of IS failure (Markus, 1983; Kraemer et al., 1993) and previous studies on EIS success factors (DeLong and Rockart, 1986; Volonino and Robinson, 1991). However, while these studies assumed that the factors are the same for all systems, this study taking the work of Vandenbosch and Huff (1997), has shown that the factors differ depending on the type of benefits expected from the systems. An EIS system developed with the objective of providing assistance to
executives' decision-making has a different set of success factors compared to an EIS built to help executives in their sensemaking activities. Similarly, the success factors are different for bargaining, commanding, and persuading. Each benefit needs different facilitating factors. The EIS benefits realisation models employed in this study is based on this principle. Vandenbosch's and Huff's work was adopted for the learning category. However, as Vandenbosch and Huff study only look at environmental scanning, other studies were used to formulate success factors for the other categories. The organisational factors and the system's characteristics were adopted from studies on critical success factors for EIS such as Delong and Rockart, Volanino and Robinson, and Watson et al. Some of the individual difference factors were adopted from the work of Weick and Neustadt.

The benefits realisation model for learning was adopted in the experiment for the Bernama news and the trade applications. The model was based on the work of Vandenbosch and Huff which proposes that a predisposition towards scanning, strong organisational support, and system characteristics are all factors which contribute towards scanning. This was based on their field work on seven organisations both public and private covering a total of thirty-six executives. They found that a predisposition toward scanning behaviour was linked to tolerance for ambiguity and innovativeness. For system characteristics, integration and flexibility of the applications seem to be related to scanning behaviour while a strong social influence for EIS scanning is the organisational factor. The clear pattern that emerged from Vandenbosch and Huff study, in spite of the wide variations found in the seven sites investigated provide strong support for the model.

For the experiment on the Quran application the researcher used the EIS benefits realisation model for persuasion. The model is as in Figure 3.18. As explained in Chapter three the individual differences which favour persuasion are taken from Neustadt (1960). Neustadt has argued that the persuasive power of a President depends on his public prestige, authority, and good reputation. These factors would similarly be applicable to a Prime Minister who like a President is a political head of a country and thus need to be able to persuade the public. The organisational factor which has an impact on persuading
is the level of education of the audience. Persuasion is effective if the author’s logic is understood and well analysed by his audience. Generally an educated audience will be able to logically weigh and analyse the arguments presented to them. For system’s characteristics the model proposes differentiation, integration, flexibility and communication facilities as the critical factors. Differentiation gives the user different kind of information and from different sources, increasing his knowledge and widening his understanding which contributes to his competence and thus improve his reputation and credibility. Integration further assists his understanding of certain problems as it brings together related issues and with flexibility this can be viewed and analysed in multiple ways, deepening his understanding.

For the experiment on the electronic meeting and decision tracking applications the researcher proposed the use of the benefits realisation model for sensemaking as shown in Figure 3.14. Individual differences that encourage these activities are an individual’s belief in group learning, and an inclination towards detailed and thorough reasoning. Weick and Meader (1993) have argued that sensemaking activities are action, affiliation, triangulation, deliberation, and contextualisation. Affiliation involves discussions and exchange of ideas within the group and triangulation brings together the different experiences, expertise and preferences within the different members of the group. An individual who emphasises detailed and thorough reasoning will ensure that issues are carefully studied and formulated before suggesting any plausible patterns. This means deliberation is important.

The EIS benefits realisation model helps the IS group to understand the factors that need to be present if the EIS applications are to be beneficial. For the learning model it reinforces their belief that a strong organisational support is essential. The model has given IS practitioners understanding why the Quran has been used successfully by the P.M. The sensemaking model gave the IS group the factors that would encourage cooperation among users.

In the process of the experiment amendments were made to the benefits realisation model for learning. The element of user support was included as a success factor. This came
about when comparing the two learning applications, BERNAMA news and external trade. The external trade is not as utilised as the BERNAMA news even though both have the same group of users. This suggests that individual differences alone could not explain the utilisation and the non-utilisation of EIS applications. Observation and feedback during the experiment suggested that the organisational factor of user support is a very important determinant of successful usage. The executive users have beneficially used BERNAMA news which is regularly publicised and given much user support. On the other hand the external trade system has not been successful and this corresponds to its lack of user support efforts. It was also found that the more technical external trade application needs good subject matter support. Technical expertise alone is not sufficient.

Another issue that we can see from the realisation models is that some of the realisation factors are controllable and some are uncontrollable. Under user differences, the psychological factors such as "Tolerance for ambiguity" and "innovativeness" are mostly uncontrollable. For example it is almost impossible to change a user from being one with tolerance for ambiguity to one without. Another factor, innovation, may be partially controllable. A partially controllable organisational factor under learning for example is the social influence factor. In his work on social learning theory, Bandura (1977) postulates that role models could positively influence innovation adoption. Empirical support for this contention is provided by a multitude of field and case studies that link the presence of a champion and an individual who enthusiastically promotes an innovation through critical organisational stages and innovation success. Thus encouraging highly regarded, visible organisational members to use PC's may be a partially controllable factor, and for example it may be possible to influence norms by publicising the successes of early adopters of technology. Individuals may also use computerised systems because they think the people who are important to them will perceive them as technologically sophisticated (Igharia et al. 1996). Evidence from the experiments has shown that the Deputy Principal Private Secretary to the P.M. is the role model in the office. She has influenced a number of executives in the office into using some of the EIS applications by demonstrating the advantages of the applications. Her ability to respond quickly to requests for information by the higher authority has also encouraged the other executives into using the EIS.
Focussing on controllable and partially controllable factors would lead to stronger potential to realise EIS benefits (Cheney et al., 1989). Efforts would not be wasted on uncontrollable factors as there will not be much effect.

In using the benefits realisation model, it is realised that there is little difference between it and the benefits model. Both models proposed factors that will lead to the realisation of EIS benefits. Under the benefits model the focus is on the EIS features, organisational mechanisms and behaviour that will lead to certain EIS outcomes and end benefits. For the benefits realisation model, the success factors are grouped under user differences, systems characteristics and organisational context. Hence the models are almost similar except that the benefits model does not cover the individual differences. The method would be less complex if the two models could be merged together.

8.2.4 Affirmation of the method

The experiments have shown that the EIS BM method is applicable at any stage of a project. It can be employed at a stage where the EIS system has just been identified as well as for EIS systems that are currently in use. The objective of the former is to ensure that potential benefits are identified and plans are made for their realisation, while the latter is related to whether the system has achieved its benefits and how these benefits can be further realised. Two of the systems used in the experiments are applications which are at the justification stage while three applications are currently in use. For EIS applications which are at the justification stage, the benefits model shows the potential benefits which could be achieved when the applications are implemented. Understanding the particular executive role which the application will be of assistance, the causal model of EIS benefits provide guidance as to the essential factors and conditions that must be present to ensure the realisation of the benefits.

The experiment with decision tracking and electronic meeting helps the EIS group to identify the potential benefits of the applications. It gives them understanding as to the specific executive activities that the application will assist. The success factors give them the framework from which they can monitor the developments of the applications. In fact
the method is applicable even at an earlier stage. Selection of vendors is more objective and effective with the ability to compare the vendors' prototype systems against a set of technical features. The costs will be more meaningfully compared. Preparations can be made for appropriate promotion and training programmes. The EIS support group will be able to equip themselves with the necessary skills and expertise.

Similarly the experiments have shown that the method is equally applicable for applications that are currently in use. In evaluating the application the method could highlight the benefits that are not being realised or fully realised. The experiment with the external trade system is an example of this. The BM method provided the framework within which the system was analysed. It explains the application's lack of utilisation. It points out to the success factors, which are lacking, organisationally and technically. Hence it provides the EIS group with the necessary steps that can be considered to further realise the benefits. Evidence from the experiment has shown that the benefits from the external trade system have shown an improvement. The special officer who has not used the application has been using it consistently now. A recent interview with her has confirmed that she regards the application as her important reference and she has suggested a few improvements to the application. This was due to the increased support that she has been getting. She has commented "The computer people should have told me about the system earlier. It is very useful to me, however, there are still gaps in the information and I would like to have some current trade indicators highlighted in the application."

8.2.4.1 Overcoming the shortfalls of current benefits management method

The shortfalls facing the current benefits management method are: cost of creating benefits model; cost of creating benefits realisation model; lack of organisational learning; method applicability only at the start of project. The above discussions have shown that the proposed EIS benefits management method has overcome the first two shortfalls by incorporating both standard benefits models and standard benefits realisation models. The utility of both models was affirmed in the experiment. Selection of benefits plan only involves the selection of the appropriate causal model and the plan to realise the benefits were speeded up and made more systematic by the benefits realisation plan. Both
time and manpower are saved; reducing the cost, which would otherwise, has to be spent for each project.

The application of these standard models improves organisational learning. This is evident in the experiment with the BERNAMA news and the external trade application in the P.M. office. Using the same model to compare the BERNAMA news and the external trade system allows the office to evaluate the factors that undermine the benefits of the external trade system. By focusing on these factors the office was able to take appropriate corrective actions and increase the utilisation of the system. Another shortfall that is addressed by this proposed method is its utility throughout the system lifecycle. The experiment in the P.M.'s office has demonstrated that the method is applicable at any stage of the project lifecycle.

8.3 Other Findings

8.3.1 Confirmation of Mintzberg’s Managerial Roles

The findings of the study on executive work in the previous chapter validate Mintzberg’s (1973) study on managerial work. The ten managerial roles proposed by Mintzberg are applicable to the three executives in the study. There are several implications that can be drawn up from this. First, it shows that Mintzberg’s study can be generalised over time. Even though Mintzberg conducted his study in the early 1970s, the current study carried out in the late 1990s still produces similar results. A study replicating Mintzberg’s work in the early 1980s also produced similar results (Kurke and Aldrich, 1983). Hence, over three decades, Mintzberg’s work is still applicable. Executives still act as figureheads, they play the role of leaders and still are the liaison for their organisations. It shows that very little has changed in the work characteristics of executives despite vast technological advancement in the office environment. Even though IT has appeared prominently in the office environment especially since the late 1980s, there is little impact on the way executives do their work. Face-to-face meetings are still the favourite way to exchange information.

Second, the findings also generalise Mintzberg’s work across cultural boundaries. Unlike Mintzberg whose study was carried out in North America, the current study was
undertaken in Malaysia. There are vast cultural differences between the two countries. One is a big western country which is very well developed and advanced economically and technologically. Another is a developing eastern country. Values and customs differ. Both countries have their own culture and organisational systems compatible with their own norm and value systems. Malaysian culture may be characterised by centralised decision making which may lead to expectations of more assertive and less accommodative styles being used toward subordinates (Kraemer, 1989). Americans are individualists who favour decentralised government (Zuckerman, 1999). However, despite these differences, the results have indicated that executives of the two countries have similar work characteristics. Executives in Malaysia also spend much of their time undertaking leadership and figurehead roles. Their time is frequently interrupted by informal meetings. The percentage of their time spent on decision making is much lower than what is usually thought. Hence, cultural differences appear irrelevant in comparing executives' work. The study suggests that executives wherever they are, are more likely to have similar work characteristics.

Third, the work is generalisable not only for heads of corporations and ministries but also for heads of government. The study on the Malaysian P.M. shows that he has similar work characteristics with other executives in the study. The ten roles apply to him and to the other two executives. The P.M. spent much of his time undertaking the interpersonal roles of a figurehead, leader and liaison. As head of government he spent much of his time on official receptions, welcoming and entertaining foreign dignitaries besides attending formal and informal local functions and officiating projects and conferences. He is actively involved in the informational roles of a spokesman, monitor, and disseminator. He gets feedback and monitors policies and projects through weekly cabinet meetings and reports that are presented to him. At the same time the P.M. is also busy carrying out the decisional roles. He prioritises projects and thus decides on the allocation of resources. The findings as discussed in Chapter Seven clearly show that the ten roles as proposed by Mintzberg are applicable in the Malaysian environment.
8.3.2 EIS use by executives

Who are the users of EIS? According to Worcester (1998) the users are “busy executives whether on the road or in the office, who have little time to spend reviewing stocks of detailed reports ……and key people who do not have the time for extensive training to obtain the information they need from a software application.” (p.78). But do executives use EIS?

The study has shown that executives are great information processors. It is their routine to attend lengthy formal meetings and they have frequent informal meetings. In these meetings they receive and disseminate information. According to the study by Igbarial et al. (1996) the level of IT usage was associated with the amount of time spent by managers on information-related activities for example reading reports and gathering information. However, in this study even though the executives spent a lot of time on information-related activities, their use of IT to help them in processing the information is very limited. As is the case with most EIS, their use is optional. Thompson and Higgins (1991) have written, “When use is optional, however, having access to the technology by no means ensures it will be used or used effectively” (p.125). They still depend greatly on verbal communication. Executives tend to use other managers and their own intuition as their primary information sources. As quoted by Kraemer et al. (1993) “Even with CBI available, top-level executives primarily deal through people for information”. The PM uses very little percentage of the information provided by EIS. This is in alignment with many other studies which suggest that computer use among executives are not encouraging. Why have executives not adopted EIS wholeheartedly? The most frequently proposed suggestion is that EIS can not replace other sources of information. Mintzberg has observed:

[Executives] seem to indicate strong preferences for current information, much of which is necessarily unsubstantiated (gossip), and for information on events rather than on trends.....

This kind of information, not that carried in formal reports, forms the heart of the manager's information system. The [executive] develops an understanding of his milieu by piecing together all the scraps of data he can find....

As a result, the [executive] can expect little help in the performance of his monitor role from the traditional formal information system. It provides historical, aggregated information, whereas he seeks current, “trigger
Similarly, Mohan et al. (1990) have reported that senior managers responsible for strategic decisions of an organisation have traditionally been slow to take up computer technology at work. Boone (1995) has said that business executives have been slow to embrace available technology particularly computers. The reason for this to her is that the executives do not realise how computers will help them improve their company's performance. She argued that executives are avoiding computers because they do not want to waste their time or they do not want to do what other employees should be doing. They do not understand what computers can do for them personally. They think that they would become high-price administrators or secretaries. To Boone the real power of computers is that they can augment the executive's intellect. To her an EIS can help executives become good leaders. A report of a 1988 study by Kraemer et al. (1993) has concluded that despite the importance of computer based information systems for most public managers, there was little use of computers by the executives themselves. The study has shown that executives' use depends a lot on intermediaries. To Kraemer et al. (1993) executives prefer human sources as people provide richer substantive information, filter information for relevance, and provide the social context of information. At the same time it is also argued that executives can query human sources more extensively than other sources. They can also challenge or receive confirmation of their interpretation of the information directly from the source. In the study, the P.M., besides Quran, rarely accesses other EIS applications directly. Much of it is done through his officers and assistants. This is despite the fact that the P.M. is very much into technology. He believes that IT is the key to national development and encourages its use in every aspect of government and business. However, in terms of benefits, the P.M. and the other executives do get the benefits of the information. Direct usage is not a pre-requisite for the EIS users to enjoy the benefits. The system user of the EIS may be the executive, or it may be operated on by an intermediary (Rockart and DeLong, 1988). In fact the findings by Kraemer et al. (1993) shows that computer based information is judged most useful by managers who get the information through others who screen and interpret that information for them. Computer-based information is not judged as useful by those
managers whose computing use is more frequent, direct, and hands-on. Hence, as has been discussed in Chapter 7, usage through intermediaries may be very significant for EIS as executives are a group of very busy people. This again emphasised that the EIS support group has very important roles to play. Hence having support group whose members are only technically competent may not be sufficient.

8.3.3 The Uses of EIS

An EIS is designed to assist executives in doing their work. As discussed in Chapter Two, theories of executive work, there are six categories of executive work. As such a system that is designed for executives ideally must be able to provide assistance in all the six categories. It should be able to help executives in enhancing their understanding, their decision making and their implementation both as individuals and as a group.

The study has clearly shown that the EIS systems in all the three public organisations are used more as learning applications. The majority of applications lie in the learning category. In the PM's office, more than 73% of the EIS applications are within the learning classification. Similar situations exist in the Ministry of Agriculture (80%) and the State Secretary's office (75%). Out of ten applications in the Ministry of Agriculture, eight are in the learning category. For the State Secretary's office, out of eight applications, six come under learning. All these EIS are used to increase executives' understanding of their organisations and the environment they face. Very few of the applications are used to help in decision making. The study has shown that only 15% of the applications are within the decision-making category. This finding is contrary to some of the EIS literature which puts assistance in decision making as an important objective of EIS (Leidner and Elam, 1995; Leidner, 1997). The reason for this may be looked at in two ways. First, in all the three organisations informational roles are much more prevalent among the executives. As such it is only appropriate that there are more learning applications in the organisations to support the scanning and monitoring roles. Second, the executives may be relying more on verbal communications for information in their decision making. This is supported by findings in the study which show that IT use among executives is still low. The study has also shown that in all the three organisations there are no EIS applications that lie within the bargaining category and there is only one
in the commanding category. Generally also there are very few applications that support group learning or sensemaking. The common sensemaking application in all the three organisations is electronic mail. This shows that current EIS applications are still very limited not only in the benefits achieved but also in the types developed. For the P.M.'s office, even though the EIS has been developed for nearly ten years, the EIS has mainly focussed on supporting the scanning role of executives. Little attention has been given to support the executives' other roles. This is because the office has never directly considered executives' roles when identifying applications to be developed. Some of the applications developed are the result of requests from the P.M. himself, some identified by the executives but most are identified by the EIS group based on previous requests for information. The theory of executive work has indicated that there are still many areas where EIS can be of help.

An interesting finding of this study is the use of EIS in persuasion. This is demonstrated by the use of the Quran application by the Malaysian P.M. Very little in the EIS literature has described this pattern of EIS usage. Reports by Meiklejohn and Harvey (1991) have cited a couple of cases where EIS are used to persuade others. In this study however, the Quran application is used primarily as a persuasion tool even though all the while it has not been recognised as such. The PM uses quotations from the verses to back up his speeches so as to persuade his audience to accept his views. He goes through the applications improving his knowledge on certain relevant topics or subjects so that he will be able to portray the image of a learned Islamic leader through his discussions, his speeches, and his writings. This is very important within the Malaysian political scenario. The use of the application clearly demonstrates the use of EIS in persuasion. The benefit of enhanced reputation is clearly observed in this case. The current political scenario in Malaysia where Islamic issues are the main issues to gain political support makes this application even more important. As more and more Malaysians become more educated and are exposed to various views that were not easily available before, persuasion becomes more important. This again shows that EIS applications are not restricted to decision making applications as widely reported. It shows that EIS can be of assistance effectively in all the roles played by executives.
This finding has raised another important issue. It points out that there are many more EIS applications which have the potential in helping executives especially in terms of bargaining, commanding, persuading and sensemaking activities. Potential EIS applications can be identified in terms of these activities and their potential benefits extracted within the model. Hence, in the process of managing the EIS benefits, the method at the same time was able to highlight other potential areas which EIS can assist. It shows how the present EIS systems have only looked into a small area of executives' work. There are still very little impact of EIS in group work. Few EIS applications are developed to address executives' group activity. Most of the applications still cater for executives' individual needs.

8.3.4 Supporting Executives Use of EIS

The importance of internal support to the success of user computing has been highlighted in many studies. Researchers have reported a positive relationship between personal computing success and various internal user computing support services mainly through the information centre (Bergeron et al. 1990, Mirani and King 1994). They have reported that systems were more successful when there was user computing support. For most users, system success was higher when more support needs were fulfilled. Raymond (1988) in his study of computer usage in small firms has also reported that training promotes greater understanding, favourable attitudes, more frequent use, and more diverse use of applications. Similarly this study has shown that for EIS applications to be meaningful and beneficial to its users, the support group must play a very important role. Evidence from the experiment has shown that responding to users' training needs only when requested was not sufficient. The support group must be pro-active to the needs of the users. The group must always find opportunities to show the latest updates and features of applications to the executives. User manual, brochures, and newsletters highlighting new updates and applications are not sufficient. Personal, one-to-one training is necessary with executives.

Other evidence from the study is that not only technical training is important but the support group must also have the capability of interpreting the data and presenting them in a meaningful format. Members of the group must be conversant with the subject matter
of the application. Having only technical people in the EIS group will greatly hamper the support that can be given to users unless the technical group has competent subject matter personnel. The EIS used in the P.M.'s office covers a wide variation of topics, administrative, social, economics and politics. Subject matter knowledge of these topics is essential not only in collecting the relevant information but also in analysing and presenting the information in a meaningful way. Having someone in the group who is competent in the subject matter may enhance the EIS group capabilities in supporting the executives. This may be one of the important factors that will increase the realisation of EIS benefits.

The EIS support group must also be highly proactive, anticipating the needs and requirements of executives. The change of EIS support group as proposed in the experiment has resulted in an increase in the utilisation of the EIS. Executives have begun to use applications which they have not used regularly before. An officer who is an aggressive marketeer of the EIS now heads the support group. She has produced a plan for periodic training while at the same time caters for ad-hoc training as and when required. The user support head who is highly technical is now heading the development section.

8.3.5 Benefits Justification and Evaluation
From the study it is seen that benefits justification and evaluation rarely happens. Most ideas arise from the IS group. The group normally identifies the applications to be developed based on their own knowledge and assumptions. The justification process or the pre-project evaluation is not taken seriously. As shown from the study, the process of project justification only involves very general statements about the advantages of having a particular system. Statements such as 'the system will assist executives in their decision making' are commonly used in the justification for developing an EIS application. Requests by the P.M. or from other senior executives for certain information is justification in itself for developing a particular system. An application is normally approved without having to really identify the benefits that it will deliver.
With no specific benefits identified for the system, technical considerations become the main criteria that are monitored during development. The presentation technique such as the design of the menu, the layout of the screen and the colours used become the main issues that are discussed.

Similarly there is not much effort expended in the post-project evaluation. In the P.M.'s office, there was some evaluation when the EIS applications were moved from the mainframe to the client server system. However, since no justification was undertaken, the evaluation only looked at the utilisation and whether users still find the applications useful. The evaluation was not able to compare whether benefits of the systems have been achieved since no benefits were identified.

8.3.6 Benefits of Extraction
Much benefit remains to be extracted from EIS. Existing applications have many latent benefits. Some of the applications have not been utilised and hence the benefits that these applications could offer have not been tapped. The models adopted for the method that is, the theories of executive work and the benefits model provide the framework which describes the potential benefits of the applications. The benefits model elaborates on the organisational mechanisms and the behaviours that would lead to the realisation of the benefits. Utilising the models would help organisations to create these necessary conditions.

There are many areas of executive work of which there are no applications. This provides the IS group and the management potential areas for new applications.

8.3.7 Implementation of EIS benefits management method
The concept of benefits management is new to the three organisations studied. However, the systems groups in these organisations are familiar with ex-ante and ex-post evaluations. Although these groups understand the importance of both pre-project and post-project evaluations, these are not demonstrated into actions. Justification of projects is not seriously thought about and post-project evaluations are seldom done. Interviews and observation undertaken during the study have shown that the management group is
much more receptive to the idea of benefits management and its importance. The idea of benefits management is less appealing to the system’s group. This may be contradictory to popular beliefs that systems people are naturally more receptive to IT enhancement ideas compared to management. Comments such as “Benefits management is only important for developed countries, which are advanced in their usage of information systems” were frequently heard during the study. One system personnel has commented, “Perhaps we can adopt the idea of benefits management once our IT development has stabilised. Now there are so many things to do.” A senior information systems personnel from a private company undertaking systems work in the P.M.’s office has said that there is no time to do an evaluation as they are busy playing a catching up game with advanced countries. There is so much work to do that they do not have the time to look at what they have developed as many other projects are waiting. This shows that the idea of benefits management though acknowledged as important is not a priority in both public and private sectors. However, they do not overtly reject the idea of benefits management. Their resistance or opposition seems to take a more passive form, criticising the need for benefits management and arguing that the time is better spent on developing many other applications in the list. The lack of overt opposition is perhaps due to the fact that the idea is forwarded by a senior member of the group and is known to have the backing of top management. Benefits management is believed to consume a lot of time and will delay the many IS projects that are in the pipeline. However for the management group, what is important is the benefits that they will be getting from the systems. As such a method which can enhance the achievements of these benefits would naturally appeal to them.

One of the ways to tackle this problem is to convince the EIS group on the importance of benefits management. They need to be convinced of the benefits of the method. Without conviction, the method will not be fully accepted and hence successfully implemented. With conviction comes commitment. Commitment from the group is vital. In IS development project, commitment is believed to affect the eventual success of the system (Boiney, 1998). When commitment is low, individuals may contribute minimal time and energy to the task and become easily discouraged. Lack of commitment could lead to indifference or deliberate resistance. As a result projects may be abandoned midway. Commitment has been defined as a state of mind that holds people and organisations in
line of behaviour (Staw, 1982). It encompasses psychological forces that bind an individual to an action as well as structural conditions that make behaviour irrevocable or difficult to change. Commitment has been argued to greatly affect the persistence of behaviour. A high level of commitment to an IS project reflects the belief that the system will make a valuable contribution to the organisation (Weill, 1992). Similarly, a belief that the BM method will result in a better management of benefits will instil a commitment among those responsible for implementing it. To have the commitment, understanding of the benefits of the method is important.

The group needs to understand the technique of the method and how its implementation would bring advantages to the organisation. Without appropriate skills and information even a highly committed team will suffer from an inability to complete certain tasks, ultimately resulting in poor outcomes (Boiney, 1998). In the study the researcher held a number of discussions going through the benefits and the process of the method. She explained the models underlying the method and the terminologies used. Having the co-operation from senior management and the IS director helped the process. The experiment shows that without the co-operation the process might have been difficult.

Another relevant point that arises out from this study is the structure of the IS group. Implementation of BM method needs to be carefully done if there are various sections in the group. In the P.M.’s Office, the IS group is divided into four subsections. These are the system development section, the office automation section, the operations section and the user support section. The system development group is the group responsible for developing and maintaining the EIS. While the user support group is responsible in marketing and supporting the EIS applications. These segmentations have in a way acted in an adverse manner in BM method implementation. As benefits management entails the whole process, from benefits identification up to post project evaluation, the various sections must be able to work together throughout the life of the project. Evidence from the experiment with the trade system has shown that the development group was reluctant to improve the system further as the group believed that the application is already useful, but the support group has failed in marketing it. To the application group, what is needed is more aggressive promotion and training. However, the support group felt that since
they have already shown the application to the executives earlier, they have done their part. The support group believed that users did not find the trade system beneficial since there was no request for further training of the system. The conflicts between the two groups posed a problem in the implementation of the BM method during the experiment. It was difficult to convince the development group to enhance the trade system since the system is not utilised. To the group any enhancement will be a waste. A member of the group commented, “We have been updating the system tirelessly for a decade, no one appreciates our effort. I do not think we should waste more time on the application.”

One solution is to have team-based projects. The team is responsible from justification up to post project evaluation. The team will then be responsible for the realisation of the project benefits.

“Any new strategy, no matter how brilliant or responsive, no matter how much agreement the formulatots have about it, will stand a good chance of not being implemented fully – or sometimes at all – without someone with power pushing it”. (Kanter, 1984, p.296) A prime mover pushing a new strategy has to make clear that they believe in it, that it is oriented toward getting something that they want, because it is good for the organisation. In this study, the power behind the implementation was the Deputy Principal Private Secretary to the P.M. Being the former director of the IS unit and now in charge of all administrative matters she has a powerful control over the unit. Convinced by what the researcher has said about benefits management, she was eager to implement the method.

8.3.8 Educational Needs of IS practitioners

The study has shown that there are gaps in the knowledge of IS practitioners in terms of the management and support of IS projects. IS practitioners have all along emphasised the technical aspects or technical know how. However, as the study shows the demand on IS practitioners go beyond solving technical problems. As suggested by the study the subject matter or the content of the system is equally important. Hence, it is no longer adequate for IS practitioners to be competent only in technology, they need to have an in-depth understanding of the business, functions and needs and a good knowledge of the
requirements of the executives. IS practitioners need to equip themselves with the relevant knowledge as they are the group which give support to the executives.

Knowledge of IS evaluation is greatly lacking. The IS group in the study is aware of IS evaluation but they do not feel the need and hence do not practise it. Seminars and courses on the importance of benefits management are essential. The IS group requires training on the concepts and the underlying principles of benefits management. They need to understand the various available methods and be able to select appropriate methods for their needs.

The study also confirms what have been written in the IS literature on the requirement for IS practitioners to develop their interpersonal skills to work with the other groups in the organisation especially in the promotion of IS applications as well as in defining new user requirements.

8.3.9 Evaluation as organisational learning

According to Huber (1991) organisations acquire some of their knowledge through experience. Sometimes this learning is a result of intentional, systematic efforts. One approach to facilitating organisational learning is to increase the accuracy of feedback about cause-effect relationships between organisational actions and outcomes. Evaluations act as a feedback mechanism applying a critical spirit to actions taken and results achieved (Hirscheim and Smithson, 1987, Farbey et al. 1993, Walsham, 1993). One could argue that retrospective reviews form part of the organisation – as interpretation system (Daft and Weick, 1984). Such reviews provide a collective forum in which the organisation derives some sense from its recent, specific experience. Reviews provide opportunities to explain why things had gone wrong. They give rise to greater knowledge. Thus organisational experiments become the learning mechanism. The experiments set out in this study are a form of learning. Learning is promoted in terms of what organisational scenarios are important to achieve specific benefits, what technical features are critical and how the executives can be motivated to use the EIS. The continuous experiments will be a base for continuous learning in the organisation. Walsham (1993) has promoted the idea of evaluation as learning. This comes about
through interactions between individuals in the group and through the feedback mechanism. According to Fiol and Lyles (1985) reviews produce both cognitive and behavioural learning. As a result there is an improvement in understanding and new responses and actions.

Hence the process of benefits management itself is a learning process. The use of the method to study several existing EIS applications in the P.M.'s office provides a useful learning experience. Much knowledge is obtained about why the external trade system is less successful than the BERNAMA news-on-line service. The use of the method to study the decision tracking and electronic meeting systems reveal potential benefits of the systems which have not been explored by the EIS group.

Another learning perspective which we can look at is that the study has given the group the knowledge on benefits management as well as the vocabulary in the areas of executive work as well as benefits management. Benefits management is foreign to almost every public organisation in Malaysia. However, they are aware of pre and post project evaluation even though not much of it is practised. Benefits management is a new concept and the implementation of the method in a central agency such as the P.M.'s office will increase the probability of the concept being spread to other government agencies. The study has also introduced the organisations the vocabulary with which they can describe executive work.

8.4 Summary
The chapter discusses the results of the experiments carried out to test the EIS BM method. The results affirmed the models and the principles underlying the proposed method. Initial results of some experiments to improve benefits realisation were also looked into. An important finding from the study is that the EIS benefits management method provides EIS stakeholders a framework to analyse current and future EIS applications. Organisational learning is an important result out of this analysis. The next chapter will conclude the contributions of the study and will highlight further directions for the work.
CHAPTER 9:

CONCLUSION

9.1 Research Contributions

The aim of the research described in this study was to identify a means of ensuring that the benefits of executive information systems are realised. Historically, there are two schools of opinion on this issue. One assumes that these benefits are usually realised, but because they are difficult to measure they are likely to go unrecognised. The other view is that they are rarely realised because of lack of management attention to the process of EIS development. This dissertation adopts the latter assumption because it is more commonsensical and because it is consistent with the author's own view. Hence, the answer to the problem of realisation of EIS benefits is to create some method which will ensure that appropriate attention is given to benefits throughout the development of EIS. This study identified a technique called benefits management as the most likely starting point for such a method. However, it found several significant problems with existing benefits management methods.

First, they do not seem to recognise that such a technology, such as EIS, has the same potential benefits wherever applied. Secondly, they do not directly support organisational learning. Thirdly, they are only applicable at the outset of the development life cycle.

The chief contribution of this dissertation is to revise the standard benefits management method to address these three problems directly. It does this by introducing the concept of generic models showing what organisations must do in order to realise the benefits of EIS. These models have several beneficial functions. They may be used at the outset of projects in order to assist stakeholders to develop benefits models quickly. They may be used at other stages of a project, particularly after implementation, to judge the degree of benefits realisation even though no benefits model was created at the outset. They also serve as a repository for an organisation's knowledge of how to achieve the benefits of a particular technology.
Much of the effort of this research was exhausted on the creation of generic benefits models for executive information systems. This was particularly arduous because there is no agreed understanding of what an executive information system is. An extensive investigation of the literature on EIS showed that there were at least three notions of EIS - Executive Retrieval Systems, Executive Support Systems, and Executive Communication Systems. Each of these three archetypal systems is made up of a subset of five distinctive features: information retrieval, modelling and simulation, communication, integration, and easy to use interface.

This definition and appreciation of EIS itself is a contribution to the subject and helps to organise the vast array of characteristics and case studies of EIS use found in the literature.

The dissertation then examined the role of information in executive work in order to understand how each type of EIS might benefit executives. An investigation of the empirical studies of executive work suggested that Mintzberg’s classification of executive’s task was based on the most secure foundations. An examination of the theoretical literature on executive work found that these theories could be divided into six categories. Each of these categories corresponded to a subset of the task identified by Mintzberg.

Since the role of information in each of these six types of executive activity differs, there was a need to create six, rather than a single, causal benefit maps and benefits realisation models. This was done by examining a variety of empirical research concerning the use of information in executive work. Each of these studies was categorised by the types of executive activity involved.

The results were a set of generic models which were warranted because they were based on previous research. These generic models could be the starting point for the development of a theory of EIS and hence, are a significant contribution of the study.

The methodology adopted to test this method and its component generic models was pragmatism. In particular the dissertation employed Schön’s reflective approach to practice. The justification for this approach was that this study represented research into
practice and hence, utility was the appropriate measure of its worth rather than explanation, prediction, or understanding. However, the major drawback to this research philosophy is that it has rarely been used within the information systems research community. Therefore, some effort was necessary in order to justify and develop its applicability. This is a secondary contribution of the study.

The first aspect of this study was to affirm the taxonomy of executive work. This was done by replicating Mintzberg's observation study of executives by shadowing two senior civil servants in the Malaysian government and the Prime minister of Malaysia, too. The outcome was almost identical to Mintzberg's in spite of the fact that the research was conducted in the public sector in a quite different culture more than 25 years after the original study. This indicated that there was a strong warrant for using this taxonomy as basis for explaining the benefits of EIS. The reaffirmation of Mintzberg's work was a contribution of this research.

The major effort to affirm this method though consisted of performing six organisational experiments. The first was to undertake a baseline study in order to ascertain the extent and the degree of satisfaction with EIS application within three Malaysian government agencies. The technique employed was a modification of the approach used by Belcher and Watson in Conoco. Its use was, therefore, warranted in this situation. When the outcome was assessed in light of the four requirements of reflective practice, all four were found to be satisfactory.

The remaining five experiments employed the causal benefits maps and the benefits realisation models to evaluate specific EIS application. Two of these were learning applications. Two were sensemaking applications. One was a persuasion application. The learning and persuading applications were operational. The sensemaking applications were at the justification stage. Users felt that the benefits for persuasion and one of the learning applications had been realised. Users felt that the benefits of the other learning application had not been realised.

The application of the proposed benefits management method to each of these applications proved successful in terms of the four criteria laid out at the outset. Hence, the method was affirmed for three of the six types of EIS models. However, the results
indicated that some additions were required to the causal model of EIS benefits for learning. In the course of the experiments it also became obvious that each causal map of EIS and its corresponding benefits realisation model should be merged.

The research also produced a number of supplementary findings. It demonstrated once again that executives rarely use computers and that they mostly depended on subordinates to access computers. In general most EIS use was by lower level officials, not executives. Their use was limited largely to learning applications. However, one tentative conclusion was that executives were more likely to use computers to help them persuade or to help them communicate with colleagues in sensemaking activities.

Hence, this research largely achieved its initial objectives as well as affirming a number of previous studies which have dealt with executive’s work and executive’s use of computers. It has also opened a number of areas for further research.

9.2 Limitations and Further Directions

Although the study has provided some affirmation as to the utility of the proposed EIS benefits management method, the method’s application should be undertaken with care. Given that the experiments to affirm the utility of the proposed method involved only very few applications within limited categories, its applicability within other types of EIS have to be viewed cautiously. For existing projects, affirmation of the concepts underlying the proposed benefits management method was confined to only learning and persuading. For new projects the study has only tested the sensemaking category. This means that the benefits realisation factors and the EIS benefits model were not at all tested for satisficing, bargaining, and commanding. The success factors proposed in the benefits realisation models for these categories of executive work might not be relevant and the benefits model may not be appropriate.

To further affirm the proposed method and to expand the study, further research should therefore, continue with the testing of applications within these other categories of EIS projects. Applications from the satisficing, bargaining, and commanding categories should be chosen and evaluated using the proposed EIS benefits management method. Applications under satisficing for example may be selected and tested whether they are producing the benefits as described in the benefits model. Survey results will show
whether the realisation of benefits are due to the presence of the proposed success factors or whether the lack of these factors may have caused the non-realisation of benefits. Successful use of the proposed method will further reaffirm its utility. On the other hand, if the proposed method fails, that is, it is negated, there must be other factors which should be looked into. There should then be modifications to the underlying factors and models. These further experiments will continuously refine the models and frameworks and increase the method's utility.

Taking the P.M.'s office specifically, there are several applications under the satisficing category which can be selected for further experiments. The IS director can appoint the EIS support group to evaluate several of the applications using the proposed EIS benefits management method. The office can undertake similar experiments with sensemaking application. The results of the experiments would affirm the method or make further refinements to the underlying models.

The study has not examined applications which are really at the justification stage. The two new applications studied in the research as examples of applications at the beginning of projects had at the time of study been approved. The affirmation of the method at the stage is based more on the reflection of the IS group. Hence, further experiments with applications which have just been proposed and have not been justified would increase the method's credibility.

In fact it would be ideal if further research could be done with applications right from the justification stage up to the post-implementation evaluation. A complete process of the benefits management method could then be tested with one application. The successful use of the application would definitely affirm the method. However, if the application does not deliver the projected benefits, it indicates that the method has to undergo further changes and amendments.

The affirmation was also conducted only in one organisation. This small sample size precludes the applicability of the proposed method to other organisations. As such the method needs to be tested in other organisations. To generalise the underlying concepts of the proposed method, affirming the proposed method in other organisations is necessary. First, further affirmation could be carried out in other public organisations in Malaysia.
The proposed method could be applied in those organisations with EIS. The experiments may affirm the models and factors or they may introduce other relevant factors. Either of these would further refine the proposed method. Second, further tests could be conducted in public organisations in countries such as the U.K. to see whether the method is applicable in countries other than Malaysia. Third, experiments with the method could also be carried out in the private sector. The method could be applied in private companies with existing EIS or in the process of developing one. A highly generalised EIS benefits management method would result out of all these experiments.

Another shortfall of the study is that the results of the intervention have not been monitored for a long-term period. This was mainly due to the time constraint of the study. As such it would be very beneficial if the impact of the intervention is monitored continuously for some period of time. This would increase the reliability of the results. It would show whether the increased utilisation of the application is sustainable or is just due to the Hawthorne effect.

Other problems in the study are related to the EIS benefits model and the benefits realisation models. The EIS benefits models are causal maps depicting the technological, organisational and behavioural mechanism that must be present for the realisation of benefits. The benefits realisation models propose success factors that need to be present in order to achieve the benefits. Hence, there is some duplication in the two models. The proposed method will be less complex if the two models could be merged into one.

There are a number of ways in which the proposed benefits management method might be extended. Although this study identified two generic benefits of EIS and a number of factors which contribute to the realisation of these benefits, it did not attempt to develop generic measures. One reason for this was because of lack of time. Another reason was because increased frequency of use and improved user satisfaction acted as a surrogate for benefits during this research. Of course, neither of these actually indicates enhanced benefits. However, they both suggest that the proposed benefits management method has had an impact on users' perception of a system. This demonstrates that the method has an effect, but it is insufficient to ensure that the desired outcomes are achieved. Hence, preparing a set of generic measures of benefits and contributory factors to support the
causal benefits model is necessary before the method can be employed on a commercial scale.

Of course, the problem of how to measure a particular benefit reveals their relative nature. For example, an EIS may increase the quantity of data available to an executive as well as its quality. This may lead to the problem of information overload which can affect an executive's performance. Hence, a new technology may offer disbenefits as well as benefits. In many cases the avoidance of disbenefits may be just as difficult as the realisation of potential benefits. At present the implications of failing to achieve one of the contributory factors is not documented in the causal maps of benefits. Including this information would provide a more effective tool for benefits management.

Disbenefits also raise the issue of risk. Authors often criticise elementary notions of cost-benefit analysis for ignoring risk. The most common form of risk concerns the implication of failure. Since the benefits realisation models proposed in this dissertation were developed by examining the existing literature on IS project failure, they provide an indication of the major sources of risk to an EIS project. However, this notion should be developed more fully.

This study focused on the realisation of the benefits of EIS. However, there seems to be no reason why this method could not be applied to other technologies. Some technologies are simpler than EIS, for example expert systems. It seems possible to develop a causal map of the benefits of expert systems by means of a survey of the literature of this technology. Technology which is more recent, for example intelligent agents, would pose a greater challenge since there is much speculation about their benefits, but little literature on their successful deployment.

Another means of generalising the proposed benefits management method is to apply it to IS practice. EIS have an impact on end-users. However, technologies such as object-oriented notations have an impact on IS practitioners. It would seem that if IS practitioners are slow to see the necessity for realising the benefits of EIS, they would not be quick to realise the benefits of object-oriented technologies. Using the proposed benefits management method to improve IS practice might have an equally important impact on the quality of IS development.
Since it is a complex conceptual technology, it should be possible to prepare a causal map of the benefits of the proposed benefits management method. The difficulties involved in implementing this method in the Malaysian Prime Minister's Office would be the obvious place to begin. This would allow the recursive use of the method to implement the method within an organisation.

Finally, the methodological approach used in this dissertation is novel for IS research. In order to make the case that research is at the heart of IS practice there should be more studies in this vein. Schon's reflective practice provides well-articulated guidelines for making practice research-based. There should be more research undertaken within this methodological paradigm.
APPENDICES
APPENDIX 1.1


1. **Identifying and Structuring Benefits**

The purpose of this first stage of benefits management is to understand the contribution that the expected benefits will have on the business. The objectives of this first stage are:

- to analyse reasons for the IS investment proposal
- to identify areas where benefits will occur
- to understand the potential benefits
- to understand the structure of the benefits as to its linkage to the business objectives and to the proposed IT capabilities.
- to set up measures for the proposed benefits
- to assign a financial value to the benefits where appropriate

To achieve these objectives the following activities are proposed:

i. **Identification of business objectives, benefit drivers and underlying assumptions.**

Here the objectives of the business are made clear. The benefit drivers behind the proposed investment are clarified as well as the underlying assumptions. These can be done through benefits workshops and brainstorming sessions where the project participants and major stakeholders can explore possible benefits and their implications.

ii. **Identification of areas where benefits will occur**

This second step explores who and what business processes are likely to be affected. It establishes the overall scope of the project within the business and the overall managerial responsibilities. It looks into how the potential attributes of the proposed system such as
speed, accuracy and efficiency impact the business processes. The techniques suggested for this step include stakeholder analysis and process benefits analysis.

iii. Identification of benefits / outcomes

All potential outcomes of the project are explored for sources of benefits. Any unfavourable outcomes are also identified. These can be carried out through benefits workshops and brainstorming sessions. Techniques such as Information Economics can be applied to explore the potential benefits. Other techniques suggested are top down modelling and bottom up modelling. Top down modelling explores potential benefits which follow from a chosen business or IS strategy and bottom up modelling explores potential benefits enabled by the technology itself.

iv. Structure the benefits

Here efforts are put into linking the proposed benefits to business objectives and to the underlying IT capabilities. Outcome analysis is the main technique for this step. It can be undertaken within a workshop setting. The objective of the technique is to map out the intermediate outcomes which must be fulfilled in order to gain overall business benefits from an IS project. The output from this outcome analysis is the benefits dependency network. The diagram shows how the IT functionality can enable the proposed benefits, and the linkages between IT effects, business changes, and overall end benefits. It provides a way of checking out what has to happen in order to gain the overall benefits.

v. Assess each benefit

The proposed benefits are analysed in terms of how they will be measured, whether they can be assessed directly in monetary terms or whether non-financial measures are more appropriate. An overall estimate of the benefits impact or value is then possible. Workshop sessions can be held to discuss and finalise these issues.

The main output from this first stage of benefits management is a “Benefits Statement”. It provides a more qualitative appraisal of what will actually happen as a result of the project, and what actions might be required in order to realise the benefits. It contains sections on: project overview; benefits dependency network; proposed benefits; potential risks; and potential dis-benefits.
2. **Planning Benefits Realisation**

The purpose of this stage of the BMP is to identify what has to be done in order to realise the benefits. The objectives of this stage are:

- to produce an action plan for realising the benefits;
- to develop a benefits review procedure;
- to assess the full costs and benefits of the proposed project;
- to obtain approval for the project to proceed;
- to identify and understand the required business changes;
- to assign responsibilities for business changes;
- to assess the level of support or resistance from the stakeholder group.

The activities involved to achieve these objectives are:

i. **Analyse the necessary business changes**

Each proposed benefit is analysed in terms of what business changes are necessary in order to realise the benefit. Understanding of the precise location and nature of the changes are vital.

ii. **Perform a business risk analysis**

A risk analysis is undertaken to look for any negative outcomes from the project.

iii. **Identify and assign responsibilities**

Responsibilities for making the changes must be identified, and agreement and commitment to the changes must be explicitly obtained from key stakeholders. Workshops and briefings can be organised to discuss and explain the changes.
iv. Identify and analyse the major stakeholders
Major stakeholders are identified and their views on the changes and resulting benefits analysed. This is done through a stakeholder analysis where potential sources of support and resistance are identified.

v. Produce a benefits realisation project plan.
The plan shows activities and timing for all benefit related activities. This is done through project planning sessions.

vi. Develop a benefits orientated review procedure
This procedure details the specific measurement and review processes that will be used to determine the achievement or otherwise of each particular benefit. Measures and checkpoints for project progress are laid out to ensure timely and effective actions are taken to enable benefit delivery. These checkpoints must also allow for review of the benefits realisation plan itself, given major changes in scope of the IT project or significant business changes which affect the project.

vii. Estimate the full costs and benefits of both IT and business change
Costs associated with the proposed changes are estimated. These costs include the full lifecycle costs for both IT and non-IT aspects. Together with the full structure of potential benefits, an assessment of costs and benefits can be performed.

The output from this stage is a “Benefits Realisation Plan”. It contains: benefits networks; action plan; links to IT delivery plan; review procedure.

3. Executing the Benefit Realisation Plan
The main purpose of this stage is to make the necessary IT-related business changes, in order to realise the proposed benefits.
The objective of this stage is:

- to carry out the actions as detailed in the benefits realisation plan.
Much of this stage is concerned with human factor as business changes will also require changes in attitudes and perceptions. It is important to understand the factors that affect the willingness and ability of individuals to make the necessary changes. Typical activities of this stage are:

i. **Measure "before and after" values**
Using previously agreed measures, situations before and after the project are measured to determine improvements made.

ii. **Education and training**
Some form of training and education is required for all stakeholders. However, the techniques and level of details will differ. Detailed training is required for those who will actually use the system while others may only need some form of overview.

iii. **Introducing new work procedures**
New procedures and handbooks may have to be written as the way the work is done may have been changed. These are used in conjunction with education and training.

iv. **Staff redeployment**
Changes in the way and the type of work done may mean that different personality types may be required.

v. **Communication**
As it is a people issue, communication is important. There must be open communication between management and staff, business and customers and/or suppliers. Types of communication may include: briefings; workshops; informal get-togethers; 1-to-1 coaching; newsletter; electronic mail; memos. Good communication may foster commitment and credibility for the changes to be successfully implemented.

vi. **Support network**
Changing to a new way of working may need support especially in the beginning. High level support can be provided by a project champion who has the resources and stature to
influence other groups of stakeholders. Lower level support can be provided by staff or managers who understand the importance of the changes and who can communicate and motivate their peers.

vii. Pilot Study/parallel run
Chances of success can be enhanced by having a pilot study of the system and having a parallel run before implementation.

viii. Review progress
Reviews are important so as to measure how successful the project has been and whether there is a need for the plan to be revised.

Having implemented the plan, the business organisation is using the new system and getting the benefits.

4. Evaluating and Reviewing Results
The purpose here is to determine whether the proposed benefits have actually been delivered. It is through this process of evaluation and review that the real outcomes are understood, and actions taken to ensure that maximum benefits are obtained.

The objectives of this stage are:

* to review the project
* to evaluate the benefits

Much of the process is concerned with benefits review which is undertaken in order to: determine which planned benefits have been realised; which benefits have not been achieved and why and what actions can be taken; identify any unexpected benefits or disbenefits; identify any potential benefits and ways to obtain them.

The activities involved at this stage are:

i. Prepare documentation for the review
This entails the gathering of relevant documentation and the giving of briefing to participants of the benefits review meeting. The documentation required are: benefits statement; benefits realisation plan; measurements of outcomes - before and after; record of any key decisions and changes in the original direction; any general correspondence relevant to benefits management.

ii. **Brief the review participants**
The participants must represent both business and IT who have been involved with the project. The briefing is to focus on the purpose of the review. Any relevant project documentation is also distributed.

iii. **Hold the benefits review meeting**
The meeting is a structured discussions of the outcomes of the project. An experienced external facilitator may be needed to encourage an open and honest discussions of the real outcomes.

iv. **Document the review**
The results of the review are documented in order to: record the overall outcomes; determine what actions need to be taken to fully realise the benefits; document actions agreed at the meeting; provide input to the next stage of BMP.

The main output of this stage is a “Benefits Review Report”.

5. **Potential For Further Benefits**
The purpose of this stage is to identify other potential benefits from the project and at the same time to learn from it how the BMP itself can be improved.

The objectives of this final stage are:

- to explore the potential for further benefits
- to produce an action plan for realising these potential benefits
As a result of this stage, a new project may be initiated, closing the loop in the BMP by going back to the identifying and structuring benefits stage.

The activities involved in this stage are:

i. **Review business objectives/benefit drivers/underlying assumptions**
Changes in business objectives are identified together with any new benefit drivers. Original assumptions are studied to see whether they are still applicable.

ii. **Critically assess all actual benefits/outcomes**
The assessment particularly focuses on: success factors for benefits realisation; unexpected benefits; unexpected negative outcomes; worth of project; appropriateness of measures. All these are studied to serve as lessons for future projects.

iii. **Agree the way forward**
Steps to ensure maximum potential benefits are laid out and these may include: restart the BMP; incorporate lessons learned into the BMP; close-out the project if no further benefits may be obtained.

The main output of this final stage is a “Final Report”. It contains lessons learned and the actions which must be taken for the project itself and for other future projects.
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APPENDIX 2.1

Chronological and Contact record of State Secretary

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Chronological and Contact record of State Secretary

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1*: leader/monitor/resource allocator/d'tor
## Chronological and Contact Record of Secretary-General

### Chronological Record - 09/04/97

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## Chronological and Contact Record of Secretary-General

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## APPENDIX 2.2

Chronological and Contact Record of Secretary-General

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Chronological and Contact Record of Secretary-General

Contact Record – 09/04/97

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### Chronological and Contact Record of Secretary-General

#### Contact Record – 12/04/97

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Chronological and Contact Record of Secretary-General

**Contact Record – 14/04/97**

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1*: monitor/disseminator/resource allocator
# APPENDIX 2.3

Prime Minister

Chronological Record – 21/04/97

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### APPENDIX 2.3

Prime Minister

**Chronological Record – 22/04/97**

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<td>Review cabinet papers and malls</td>
<td>8.00</td>
<td>10.30</td>
</tr>
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</table>
### Chronological Record -- 23/04/97

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>TIME:START</th>
<th>TIME:FINISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience with the king</td>
<td>8.00</td>
<td>8.30</td>
</tr>
<tr>
<td>Desk work</td>
<td>8.40</td>
<td>8.45</td>
</tr>
<tr>
<td>Discussion with Deputy PM</td>
<td>8.45</td>
<td>8.55</td>
</tr>
<tr>
<td>Cabinet meeting</td>
<td>9.00</td>
<td>12.30</td>
</tr>
<tr>
<td>Phone call (wife)</td>
<td>12.35</td>
<td>12.40</td>
</tr>
<tr>
<td>To lunch</td>
<td>12.45</td>
<td>1.00</td>
</tr>
<tr>
<td>Lunch with members of MIGHT</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Back to office</td>
<td>2.00</td>
<td>2.15</td>
</tr>
<tr>
<td>Desk work</td>
<td>2.15</td>
<td>2.30</td>
</tr>
<tr>
<td>Discussions with MIGHT</td>
<td>2.35</td>
<td>3.40</td>
</tr>
<tr>
<td>members</td>
<td></td>
<td></td>
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<tr>
<td>Desk work</td>
<td>3.45</td>
<td>4.00</td>
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<td>Post cabinet meeting</td>
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<tr>
<td>Discussion with Dato’Hassan</td>
<td>4.35</td>
<td>5.00</td>
</tr>
<tr>
<td>Desk work</td>
<td>5.00</td>
<td>6.30</td>
</tr>
<tr>
<td>KLSE charity dinner</td>
<td>8.30</td>
<td>10.00</td>
</tr>
</tbody>
</table>
APPENDIX 2.3

Prime Minister

Contact Record – 21/04/97

<table>
<thead>
<tr>
<th>Activity</th>
<th>Purpose</th>
<th>Initiator</th>
<th>Participant</th>
<th>Medium</th>
<th>Influence type</th>
<th>Role type</th>
<th>Duration</th>
<th>Place</th>
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</thead>
<tbody>
<tr>
<td>Scheduled meeting</td>
<td>Informing</td>
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<td>face-to-face</td>
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<td>leader</td>
<td>0.42</td>
<td>office</td>
</tr>
<tr>
<td>Scheduled meeting</td>
<td>Informed</td>
<td>Opposite</td>
<td>executive</td>
<td>face-to-face</td>
<td>normative</td>
<td>leader</td>
<td>0.42</td>
<td>office</td>
</tr>
<tr>
<td>Call</td>
<td>Informing</td>
<td>Self</td>
<td>citizen</td>
<td>telephone</td>
<td>normative</td>
<td>leader</td>
<td>0.05</td>
<td>Office</td>
</tr>
<tr>
<td>Reception</td>
<td>Ceremony</td>
<td>Self</td>
<td>abroad</td>
<td>face-to-face</td>
<td>normative</td>
<td>figurehead</td>
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<td>Scheduled meeting</td>
<td>review</td>
<td>Self</td>
<td>abroad</td>
<td>face-to-face</td>
<td>normative</td>
<td>liaison</td>
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<td>Office</td>
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<td>Scheduled meeting</td>
<td>review</td>
<td>Self</td>
<td>abroad</td>
<td>face-to-face</td>
<td>informational</td>
<td>S’man/mon</td>
<td>0.83</td>
<td>Meeting room</td>
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<tr>
<td>Agreement Signing</td>
<td>ceremony</td>
<td>staff</td>
<td>abroad</td>
<td>face-to-face</td>
<td>normative</td>
<td>figurehead</td>
<td>0.17</td>
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<td>Informed</td>
<td>Opposite</td>
<td>Abroad</td>
<td>face-to-face</td>
<td>informational</td>
<td>Monitor/s’man</td>
<td>0.58</td>
<td>Office</td>
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<td>Scheduled meeting</td>
<td>Informing</td>
<td>Self</td>
<td>Legislative</td>
<td>face-to-face</td>
<td>Normative</td>
<td>Leader</td>
<td>0.75</td>
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<td>Call</td>
<td>Request</td>
<td>Self</td>
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<td>Telephone</td>
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<td>Leader</td>
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<td>Self</td>
<td>Legislative</td>
<td>face-to-face</td>
<td>informational</td>
<td>Spokesman</td>
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<td>Palace</td>
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<td>Visit</td>
<td>Observation</td>
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<td>Citizens</td>
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<td>Monitor</td>
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<td>Self</td>
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<td>Normative</td>
<td>Figurehead</td>
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Prime Minister

Contact Record – 22/04/97

<table>
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<tr>
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<th>Participant</th>
<th>Medium</th>
<th>Influence type</th>
<th>Role type</th>
<th>Duration</th>
<th>Place</th>
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</thead>
<tbody>
<tr>
<td>Scheduled meeting</td>
<td>review</td>
<td>Opposite</td>
<td>legislative</td>
<td>face-to-face</td>
<td>informational</td>
<td>Monitor/d'tor</td>
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<td>State Office</td>
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<td>Tea</td>
<td>ceremony</td>
<td>Opposite</td>
<td>legislative</td>
<td>face-to-face</td>
<td>normative</td>
<td>figurehead</td>
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<td>State Office</td>
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<tr>
<td>Speech</td>
<td>informing</td>
<td>Opposite</td>
<td>executive</td>
<td>face-to-face</td>
<td>normative</td>
<td>leader</td>
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<td>Monitor/leader's assistant</td>
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<td>citizens</td>
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<td>Opposite</td>
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<td>face-to-face</td>
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<td>leader</td>
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<td>partisans</td>
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<td>normative</td>
<td>figurehead</td>
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</table>
Prime Minister

Contact Record – 23/04/97

<table>
<thead>
<tr>
<th>Activity</th>
<th>Purpose</th>
<th>Initiator</th>
<th>Participant</th>
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<th>Influence type</th>
<th>Role type</th>
<th>Duration</th>
<th>Place</th>
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<td>face-to-face</td>
<td>informational</td>
<td>spokesman</td>
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<td>informational</td>
<td>monitor</td>
<td>0.17</td>
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<td>face-to-face</td>
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<td>Opposite</td>
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<td>face-to-face</td>
<td>informational</td>
<td>mon/d'tor</td>
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<td>Charity Dinner</td>
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<td>citizen</td>
<td>face-to-face</td>
<td>normative</td>
<td>figurehead</td>
<td>1.50</td>
<td>Hotel</td>
</tr>
</tbody>
</table>

1* monitor/disseminator/resource allocator/entrepreneur
QUESTIONNAIRE 1

ORIGINAL EIS INTERVIEW QUESTIONS

1. Of all the EIS applications, which are the most important to you personally?

2. Which applications do you consider vital, as opposed to ancillary?

3. Would you replace any applications if they were no longer available?

4. Do you consider the EIS to be your department’s information transmitter to others within or outside of your department? Would you continue to distribute this data if the EIS did not?

5. Have any features in the EIS helped you eliminate data handling procedures in your own job or department?

6. Does having the EIS at your desk give you productivity advantages you did not have before?


8. Do you request data from the EIS database?

9. Do you foresee the EIS as a vehicle for future applications you or your department may need?
10. Do you know any other system(s) in Conoco that duplicates the EIS? 

11. Can you put a value on what the EIS means to you? 

12. Other comments:
AMENDED EIS INTERVIEW QUESTIONS

1. Do you regularly use EIS in your everyday work?

2. Of all the EIS applications, which are the most important to you personally?

3. Which applications do you consider vital, as opposed to ancillary?

4. Would you replace any applications if they were no longer available?

5. What benefits do you get from these applications, the benefits or advantage that you did not have before?

6. Have the EIS change the way you do your work?

7. What features of the EIS are the most beneficial to you?

8. Do you consider the EIS to be your department's information transmitter to others within or outside of your department? Would you continue to distribute this data if the EIS did not?

9. Do you request data from the EIS database?
10. Do you foresee the EIS as a vehicle for future applications you or your department may need?

11. What improvements do you like the existing EIS to have (facilities, applications)?

12. Can you put a value on what the EIS means to you?

13. Other comments:
QUESTIONNAIRE 3

EIS INTERVIEW QUESTIONS (Prime Minister)

1. What do you think about computerisation efforts in Malaysia?

2. Do you regularly use the computer systems in your everyday work?

3. Of all the computer applications, which are the most important to you personally?

4. Which applications do you consider vital, as opposed to ancillary?

5. Would you replace any applications if they were no longer available?

6. What benefits do you get from these applications, the benefits or advantage that you did not have before?

7. Have the computer systems change the way you do your work?

8. What features of the computer systems are the most beneficial to you?

9. What improvements do you like the existing computer systems to have (facilities, applications)?
10. Can you put a value on what the computer systems mean to you? 

11. Other comments: 
APPENDIX 4.1

EIS APPLICATION REVIEW – State Secretariat

1. State Statistical Information

Types of Software: Lotus Notes

Basic purpose: Gives all the socio-economic indicators of the state.

Original function replaced: Searching through reports and hard copy files

Exceptional costs to support this application:
Productivity/time savings/better information: time is saved by having the system on-line

Average accesses per month: 10

Perceived Benefits: Fast and easy access.

2. Low Cost Housing Statistics

Types of Software: Lotus Notes

Basic purpose: Gives statistics on low cost houses that were planned and built over the past 10 years by districts in the state. Projections and demands for low cost housing by districts are also included. Also included are budgets for the projects, collections and arrears of payments.

Original function replaced: Information obtained from districts.

Exceptional costs to support this application: None
Productivity/time savings/better information: a lot of time is saved by having the system online.

Average accesses per month: 10

Perceived Benefits: Very useful information for decision making.

3. Livestock Information

Types of Software: Oracle/Power builder

Maintained by: Ministry of Agriculture

Basic purpose: Gives access to livestock statistics so as to assist in the monitoring of livestock production trends.

Original function replaced: manual search through hard-copy reports.

Exceptional costs to support this application: None

Productivity/time savings/better information: a lot of time is saved by having the system online.

Average accesses per month: 30

Perceived Benefits: The tables and graphic projections are very useful, plus quick and easy retrieval.

4. Parliamentary Questions and Answers

Types of Software: Oracle/Power builder
Maintained by: Ministry of Agriculture

Basic purpose: Easy tracing of questions and answers so as to avoid giving conflicting answers.

Original function replaced: Search through paper documentations.

Exceptional costs to support this application: None

Productivity/time savings/better information: a lot of time is saved by having the system online.

Average accesses per month: 3

Perceived benefits: Simple and quick retrieval.

5. Policy monitoring, directives and decisions

Types of Software: Oracle/Power Builder

Maintained by: Ministry of Agriculture

Basic purpose: Gives easy access to the many policies and decisions that have been made to ensure that there are no duplicates and conflicting decisions made.

Original function replaced: New application

Exceptional costs to support this application: None

Productivity/time savings/better information: Better monitoring

Average accesses per month: 20
Perceived benefits: Easy and quick monitoring

6. Trade system

Types of Software: Oracle/Power builder

Maintained by: MOA

Basic purpose: To supply information on the import and export of foodstuffs.

Original function replaced: Searching through hard copy reports

Exceptional costs to support this application: None

Productivity/time savings/better information: easy and current information, a lot of time is saved.
Average accesses per month: 20

Perceived benefits: Quick and easy reference to information.

7. Senate questions and Answers

Types of Software: Oracle and Power Builder

Maintained by: MOA

Basic purpose: Easy tracing of questions and answers so as to avoid giving conflicting answers.

Original function replaced: Manual search through paper files.
Exceptional costs to support this application: None

Productivity/time savings/better information: Time is saved

Average accesses per month: 3

Perceived benefits: Quick and easy reference.

8. Press Clippings

Types of Software: Oracle and Power Builder

Maintained by: MOA

Basic purpose: Quick access to all comments and criticisms regarding the ministry so as to give fast response.

Original function replaced: Search through manual compilations

Exceptional costs to support this application: None

Productivity/time savings/better information: time is saved through the on-line facility.

Average accesses per month: 2

Perceived benefits: Very useful feedback to the ministry.

9. Minister’s Speeches

Types of Software: Oracle and Power Builder
Maintained by: MOA

Basic purpose: Quick access to all speeches of the minister

Original function replaced: Search through manual compilation

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 10

Perceived benefits: Easy reference and quick retrieval of information.

10. e-mail

Types of Software: Microsoft Outlook

Maintained by: MOA

Basic purpose: Facilitate communications among officers inside and outside the ministry.

Original function replaced: none

Exceptional costs to support this application: None

Productivity/time savings/better information: Facilitates communication

Average accesses per month: daily

Perceived benefits: Better and quicker communication, wider coverage, less inhibition.
EIS APPLICATION REVIEW – Ministry of Agriculture

1. Agricultural Statistics

Types of Software: Oracle / Power Builder

Basic purpose: Contains statistics on farmers such as the distribution of farmers by state, race, gender and land resources. Includes statistics of all agricultural products such as flowers, fruits, vegetables, cash crops, paddy and industrial crops.

Original function replaced: Manual compilation of statistics from various hard copy files.

Productivity/time savings/better information: Time looking for information is saved

Average accesses per month: 30

Perceived Benefits: Provide the most current information; easy access; fast retrieval.

The data will allow better understanding of the situation and will assist in long term planning of the agricultural sector.

2. Annual Fisheries Statistics

Types of Software: Oracle; Power Builder

Basic purpose: Contains statistics such as number of fishermen and licensed fishing vessels, number of approved foreign fishermen, statistics on marine fish landings, deep sea fishing, production and value of ornamental fish, freshwater fish, and export and import of fishery commodities.

Original function replaced: Search through manual reports.
Productivity/time savings/better information: a lot of time is saved by not having to search for the information manually.

Average accesses per month: 30

Perceived Benefits: Easy and quick access to the information. The information facilitates better understanding of the current status of the fishing industry.

3. Livestock Information

Types of Software: Oracle/Power builder

Basic purpose: Contains information on livestock population for a ten-year period and projections for the next twenty five years. It has information on livestock population by type and by state. There is also information on the production and consumption of livestock products, import and export and average retail prices of livestock products.

Original function replaced: manual search through hard-copy reports.

Productivity/time savings/better information: a lot of time is saved by having the system

Average accesses per month: 30

Perceived Benefits: The tables and graphic projections are very useful, plus quick and easy retrieval of the information.

4. Parliamentary Questions and Answers

Types of Software: Oracle/Power builder

Basic purpose: Easy tracing of questions and answers so as to avoid giving conflicting answers.
Original function replaced: Search through paper documentations.

Productivity/time savings/better information: A lot of time is saved by having the system.

Average accesses per month: 3

Perceived benefits: Simple and quick retrieval.

5. Policy monitoring, directives and decisions

Types of Software: Oracle/Power Builder

Maintained by: Ministry of Agriculture

Basic purpose: Gives easy access to the many policies and decisions that have been made to ensure that there are no duplicates and conflicting decisions made.

Original function replaced: New application

Exceptional costs to support this application: None

Productivity/time savings/better information: Better monitoring

Average accesses per month: 20

Perceived benefits: Easy and quick monitoring

6. Trade system

Types of Software: Oracle/Power builder
Basic purpose: To supply information on the import and export of foodstuffs.

Original function replaced: Searching through hard copy reports

Productivity/time savings/better information: easy and current information, a lot of time is saved.

Average accesses per month: 20

Perceived benefits: Quick and easy reference to information.

7. Senate questions and Answers

Types of Software: Oracle and Power Builder

Basic purpose: Easy tracing of questions and answers so as to avoid giving conflicting answers.

Original function replaced: Manual search through paper files.

Productivity/time savings/better information: Time is saved by having the system.

Average accesses per month: 3

Perceived benefits: Quick and easy reference.

8. Press Clippings

Types of Software: Oracle and Power Builder
Basic purpose: Quick access to all comments and criticisms regarding the ministry so as to give fast response.

Original function replaced: Search through manual compilations

Productivity/time savings/better information: Time is saved through the on-line facility.

Average accesses per month: 2

Perceived benefits: Very useful feedback to the ministry.

9. Minister's Speeches

Types of Software: Oracle and Power Builder

Basic purpose: Quick access to all speeches of the minister

Original function replaced: Search through manual compilation

Productivity/time savings/better information: Time saved by having the system.

Average accesses per month: 10

Perceived benefits: Easy reference and quick retrieval of information.

10. e-mail

Types of Software: Microsoft Outlook

Basic purpose: Facilitate communications among officers inside and outside the ministry.
Original function replaced: none

Productivity/time savings/better information: Facilitates communication

Average accesses per month: daily

Perceived benefits: Better and quicker communication, wider coverage, less inhibition.
APPENDIX 4.3

EIS APPLICATION REVIEW – PRIME MINISTER’S OFFICE

1. BERNAMA News

Types of Software: Oracle / Power Builder

Maintained by: BERNAMA (Malaysian News Agency)

Basic purpose: Gives access to the latest news from all over the world. The news will only appear in the next day’s papers. The application is frequently used by the prime minister and heavily used by his staff. Even though the application is not directly used by the staff in their daily work, the application’s popularity is due to its currentness. Getting the latest news is important especially to the Prime Minister’s aides, to know the latest happenings in the world.

Original function replaced: New.

Exceptional costs to support this application: £250

Productivity/time savings/better information: Current information is available all the time

Average accesses per month: 105

Perceived Benefits: Provide the most current information; easy access; fast retrieval.

2. Quran Application

Types of Software: Oracle; Power Builder
Maintained by: Chief Executive’s Information and Management system’s Unit

Basic purpose: allow easy and quick search for verses based on certain topics or keywords. The application includes translations and transliteration of the quranic verses. These are mainly used by the prime minister for his speeches, writings and articles

Original function replaced: Manual search which needed to be done by the Islamic centre which was at another place.

Exceptional costs to support this application: None

Productivity/time savings/better information: a lot of time is saved by having the system online.

Average accesses per month: 15

Perceived Benefits: easy and quick access to the information, complete and validated information.

3. External Trade

Types of Software: Oracle/Power builder

Maintained by: Chief Executive’s Information and Management system’s Unit

Basic purpose: Gives data on external trade between Malaysia and the rest of the world. It gives data on total exports, total imports, balance of trade between Malaysia and all other countries and the type of imports and exports.

Original function replaced: Search through reports and bulletins.
Exceptional costs to support this application: None

Productivity/time savings/better information: a lot of time is saved by having the system online.

Average accesses per month: 2

Perceived Benefits: The application is mostly used by the PM’s officers as reference in their work especially when dealing with foreign countries through such events as the PM’s visits to the countries or visits by foreign dignitaries to Malaysia. Little benefit has been achieved as utilisation is low.

4. National policies

Types of Software: Oracle/Power builder

Maintained by: Chief Executive’s Information and Management system’s Unit

Basic purpose: Gives access to all national policies that have been introduced and implemented as a reference to users.

Original function replaced: Search through paper documentations.

Exceptional costs to support this application: None

Productivity/time savings/better information: a lot of time is saved by having the system online.

Average accesses per month: 3

Perceived benefits: The application is mostly used by the prime minister’s officers as a reference in their work eg. in speech drafting; answering queries in Parliament;
5. **MSC discussions**

**Types of Software:** Lotus Notes

**Maintained by:** Multimedia Development Corporation

**Basic purpose:** enable the prime minister to access the feedback and get the opinions of those in the IT and related industries on the idea of the MSC project and its progress.

**Original function replaced:** New application

**Exceptional costs to support this application:** None

**Productivity/time savings/better information:** a lot of time is saved by having the system online.

**Average accesses per month:** 30

**Perceived benefits:** The application makes it easy and convenient for the prime minister and his staff to monitor what others think of the MSC and enables them to prepare for follow up responses and actions

6. **Government Finance**

**Types of Software:** Oracle/Power builder

**Maintained by:** Chief Executive's Information and Management system's Unit
Basic purpose: The application gives data on government revenue, government expenditure both operational and development budgets, and the classification to the various sectors and data on government debts.

Original function replaced: Search through treasury and economic reports.

Exceptional costs to support this application: None

Productivity/time savings/better information: a lot of time is saved by having the system online.

Average accesses per month: 50

Perceived benefits: The application is mostly used by the prime minister's officers as a reference in their work. It saves time and the various graphs and tables have been useful in giving presentations.

7. Election results and Analysis

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives the election results and analysis from 1986 to 1995.

Original function replaced: Manual search through paper files.

Exceptional costs to support this application: None

Productivity/time savings/better information: Search for any election result is made much faster with the system.
Average accesses per month : 3

Perceived benefits : The application keeps the historical record of election results which is used from time to time. It is actively used during election years. Gives quick and easy access to past records.

8. Electors analysis

Department/User owner : Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by : Chief Executive’s Information and Management System Unit

Basic purpose : To analyse total composition of electors in each constituency and state.

Original function replaced: Data was formerly obtained through party HQ.

Exceptional costs to support this application: None

Productivity/time savings/better information : Information is more comprehensive and time is saved by not having to get it from outside sources.

Average accesses per month : 2

Perceived benefits : Very useful during election times for analysis and strategy making.

9. Profile of MPs and State Reps.

Department/User owner : Prime Minister’s office
Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives details of MPs and all state representatives and is used basically as a basic guide for political appointments and election and by-election purposes.

Original function replaced: Formally the data need to be obtained from various sources and takes a lot of time.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 3

Perceived benefits: This is the only place where details of all MPs and state reps. Are stored. Especially useful for certain decision making.

10. Assets Declaration

Department/User owner: Prime Minister’s office

Types of Software: Lotus Notes

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: enable the P.M. to check and monitor any Member of Parliament’s asset status at any point in time. Helps to gauge the suitability of candidates for certain appointments.
Original function replaced: manual Checking by staff through paper files.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line. The P.M. can access the information himself

Average accesses per month: 1

Perceived benefits: Decision making is speeded up and is based on up-to-date facts.

11. Profile of Senators

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives details of senators and is used mainly to check on their suitability for reappointments.

Original function replaced: Manual files checking

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 2
Perceived benefits: Easy and quick reference can be made for decision-making

12. Profile of Senior Officers.

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives easy and fast access to details of senior civil servants as a reference and guide for senior appointments.

Original function replaced: Need to get the data from Public Services Department

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 4

Perceived benefits: Useful in giving a fairly detail personal background of senior officers including their experience, qualifications and social activities.

13. Hadith

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

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Basic purpose: Allows easy and quick search by the P.M. to select any subject he needs from the Hadith.

Original function replaced: manual search which was normally done by the Islamic Centre.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line and in-house

Average accesses per month: 5

Perceived benefits: The P.M. uses this application to back up certain statements he makes during speeches. Fast and integrated information makes it useful to the P.M.

14. P.M. Speeches

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives easy and quick access to all the speeches made by the P.M. since he comes into office. Used by the P.M.'s officers as a reference in their work and also heavily used by other ministries. The P.M. uses it to check on certain statements that he has made to ensure consistency.

Original function replaced: Search through files which store all the hardcopies of the speeches.
Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 62

Perceived benefits: Fast and easy reference to the P.M.'s views and thoughts.

15. New Straits Time.

Department/User owner: Prime Minister's office

Types of Software: BRS Search

Maintained by: New Starits Time Group

Basic purpose: Gives access to news printed by all papers belonging to the NSTP. There are both current and archival news.

Original function replaced: Search for certain news published weeks or months previously had to be done manually.

Exceptional costs to support this application: 50 Pounds

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 75

Perceived benefits: The search techniques enable users to use the system effectively.
16. Money and banking

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives data on loans and deposits of commercial banks, finance companies and merchant banks; classification of loans by sector; foreign exchange rates and foreign reserves of the national bank.

Original function replaced: Search through national bank reports and bulletins

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 23

Perceived benefits: Quick reference e.g in speech drafting.

17. General Economy

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives an overview of the nation’s economy for the year with basic indicators such as GDP, GNP, and growth rates of the economy.
Original function replaced: Search through the hard copy or Treasury and Economic Reports.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 5

Perceived benefits: Quick and easy retrieval facilitates usage. Used as a reference in writing papers and reports.

18. Population

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management Systems Unit

Basic purpose: Gives data on total population and population densities of Malaysia by states, strata, ethnic groups, age groups, natural rates of increase by ethnic groups, death rates and mortality rate by ethnic groups.

Original function replaced: Formally the data need to be obtained from various sources and takes a lot of time.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line
Average accesses per month : 3

Perceived benefits: Quick and easy reference in speech drafting and report writing.

19. Health

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives details of Health facilities and services in the country by states and urban and rural areas.

Original function replaced: Data need to be sourced from other ministry.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month : 2

Perceived benefits: Quick and easy access to information.

20. Welfare Services

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder
Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives data on the welfare facilities and services available.

Original function replaced: Previously information need to be requested from other departments.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 1

Perceived benefits: References to the required information is made easy and quick.

21. e-mail

Department/User owner: Prime Minister’s office

Types of Software: Microsoft Outlook

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Used as a communication tool between the officers in the office and also between the officers and the outside world.

Original function replaced: Formally PROFS was used, however the usage of PROFS was limited.

Exceptional costs to support this application: None

Productivity/time savings/better information: Less memos are sent out.
Average accesses per month: over 100

Perceived benefits: With the e-mail communication becomes more widespread and there is a feeling of less inhibition among users to communicate with their superiors.

22. Parliamentary Questions and Answers

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives easy and quick access to all Parliamentary questions and answers with regard to the P.M.’s Department

Original function replaced: Search through files which store all the hardcopies of the parliamentary questions and answers.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 45

Perceived benefits: mainly used as a checking reference to ensure the consistencies in the answers given.

23. Companies Profiles

Department/User owner: Prime Minister’s office
Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives details of all government owned companies such as performance and details on the Board of directors.

Original function replaced: Search has to be done through annual reports of the companies.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 15

Perceived benefits: Easy and quick reference to the information.

24. Production and Price

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives summary of production figures of manufacturing sector.

Original function replaced: Search through hard copy reports.

Exceptional costs to support this application: None
Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 23

Perceived benefits: Quick and easy reference.

25. Tourism

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives data on tourism and its contribution to the economy over a 5 year period. Includes data on tourists arrivals by country and regions.

Original function replaced: Data has to be sourced from other departments.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 3

Perceived benefits: Quick and easy reference.

26. Organisations

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder
Basic purpose: Gives details of the structure of all ministries and departments and their functions and responsibilities.

Original function replaced: Data has to be obtained through the respective ministries and departments.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 1

Perceived benefits: Quick and easy access to data. It is there when needed.

27. Education

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives details of educational facilities in the country. Include number of teachers by grades, ethnic groups; schools, universities, private educational facilities and total population of students by ethnic groups, states, areas.

Original function replaced: Formally the data need to be obtained from various sources and takes a lot of time.

Exceptional costs to support this application: None
Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 5

Perceived benefits: Quick and easy reference to data.

28. Manpower

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives details of manpower by educational status, ethnic groups, states, urban and rural areas,

Original function replaced: Search through hard copy reports.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 3

Perceived benefits: Quick and easy reference.

29. Statutory bodies.

Department/User owner: Prime Minister's office
Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives details of the board of directors. Used mainly for appointments and re-appointments of the Board members.

Original function replaced: Formally the data need to be obtained from the respective agencies.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 4

Perceived benefits: Fast access to information needed for decision-making

30. Transportation

Department/User owner: Prime Minister's office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive's Information and Management System Unit

Basic purpose: Gives information on the transportation sector especially shipping and its contribution to the economy.

Original function replaced: Search through hard copy reports.

Exceptional costs to support this application: None
Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 2

Perceived benefits: Quick and easy reference to data,

31. By-elections

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives details of the by-elections that have been held since 1986 and their analysis.

Original function replaced: Search through manual files.

Exceptional costs to support this application: None

Productivity/time savings/better information: Time saved by having the system on-line

Average accesses per month: 1

Perceived benefits: The analysis of the by-elections give the trend which are very useful.

32. Internet

Department/User owner: Prime Minister’s office
Types of Software: HTML

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Used to scan information throughout the world.

Original function replaced:

Exceptional costs to support this application: None

Productivity/time savings/better information: access to a wide coverage of information

Average accesses per month: over 100

Perceived benefits: a lot of information regarding other departments and ministries can now be obtained through the Internet. Less time is spent contacting agencies for some basic data. Publicity of projects which need to be told throughout the world can now be done through the Internet.

33. Federal and State Awards

Department/User owner: Prime Minister’s office

Types of Software: Oracle and Power Builder

Maintained by: Chief Executive’s Information and Management System Unit

Basic purpose: Gives details of Federal and State Awards and the recipients.

Original function replaced: new
Exceptional costs to support this application: None

Productivity/time savings/better information: Information is available when needed.

Average accesses per month: 1

Perceived benefits: Quick and easy access to information.
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