Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

by

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Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

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Declaration

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Summary of the research

The research question was to determine whether the IT governance and IT outsourcing strategies of large private companies would be practical for the NRW police and how do they differ. IT outsourcing is a common strategy in private commerce, but this relatively new for police organisations. In the past, the police have copied trends from the private sector after a delay of about ten years. In most cases, consultancy companies have advised the government to do this. But it is not useful to follow trends when companies in the private sector have already developed new strategies to adjust for errors.

This research aimed to discover how large companies manage IT governance and IT outsourcing in comparison with the police. IT governance is part of governance and IT outsourcing belongs to IT governance. In this research I described how governance in private companies and in the public service works. The intent was to find an IT company (T-systems and Telekom), a multimedia media company (Bertelsmann) and a company from the producing sector (Ruhrpumpen). This partly involved identifying their current outsourcing situation. A further step was to develop an IT governance cycle for each organisation in accordance with the COBIT framework and IT governance focus areas: strategic alignment, resource management, value management and performance management. The next step was to identify core IT capabilities in large organisations in accordance with Lacity and Willcocks’ theory of nine core IT capabilities. In the final step, these capabilities were mapped to the COBIT focus areas to develop an IT governance model which could be adapted for the police force.

Case studies were conducted at the Ministry of the Interior, three police authorities and large private companies based on Yin’s case study methods. The results were analysed using a multiple-case and cross-case analysis. My initial assumption was that the police would have more IT weaknesses and private companies would have better IT organisation and IT architecture. This would have made it easy to see clearer results. However, the police have made up ground in recent years. Nevertheless, I identified several core IT capabilities which need to be improved to optimise the police’s current IT strategy.
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1. Introduction

The research question of this thesis was: Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ? After the introduction and background information about IT outsourcing and the situation in the NRW police in the first chapter, the research question is developed and after then the research aims were defined. The literature review begins by providing general information about corporate governance, governance in public service and IT governance, all of which are necessary to understand the research question and to develop the research framework. The literature chapter explains general information about IT outsourcing and the most common forms of outsourcing. The areas of German companies which employ outsourcing and the reasons for doing so are also explained. The chapter also provides information about the volume of the IT outsourcing market and the various outsourcing theories. In chapter 2 discusses the COBIT IT governance framework and core IT capabilities, which are necessary for the later research model. The chapter concludes the literature review in order to develop the methodology for this study.

Chapter 3 explains the use of qualitative research, followed by the methodology of this research. The methodology needed for further research is underpinned by Yin’s case study method. The framework and research model for the research are develop from the literature review and current outsourcing and IT governance theories. Chapter 3 also describes how the quality of the research data is guaranteed through the use of validity and reliability checks. Chapter 4 describes the case studies and the questionnaire. Chapter 5 provides general information about the NRW police and IT.NRW. Chapters 6 to 12 describe the case studies of the individual organisations. Chapter 13 details the analysis of case studies and cross-case analysis. Chapter 14 summarises the paper, provides conclusions and implications.
1.1. Background information about IT outsourcing

In the last years the concept "outsourcing" is the magic word in the IT branch because many enterprises are in an increasingly more difficult economic situation. Markets are becoming unpredictable and the order situation is defeated by strong deviations therefore companies want to build up proficient flexibility and protect themselves from unnecessary ballast. Companies can act more appropriately to future market needs by outsourcing of non-core business related activities. Outsourcing leads not only to an increase in efficiency and short-term cost reduction, but is valid as a long-term management strategy to increase competitiveness (Braeutigam et al., 2009). But most IT outsourcing projects have failed because there are even high risks behind the opportunities which were underestimated by companies’ management (Dibbern and Heinzl, 2001).

1.2. Research problem

In the 2005 NRW local election, the Social Democrats were replaced in government by a conservative and liberal government after 30 years in power. On 26th June 2009, the cabinet decided to outsource nearly all its IT tasks to the police’s service provider LZPD and the state’s service provider, Information Technology North Rhine-Westphalia (IT.NRW). Their primary aim was to reduce costs, which means many IT tasks were outsourced to external providers (Steering group police technique, 2007). The government wanted to reduce the staff in the IT departments by transferring policemen from IT to police tasks to fill personnel gaps in the police authorities. In year 2011, IT.NRW started to take over most tasks from the LZPD’s former datacentre. In recent years IT.NRW begun performing the IT-tasks for universities, cities and judicial and fiscal authorities in North Rhine-Westphalia (IT.NRW, 2009).
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Figure 1: Future IT strategy NRW Police 2011 (project board police technique, 2007)

IT outsourcing is a common strategy in private commerce, but for a police organisation it was quite new. In the past, the police have copied trends from the private sector with a delay of about ten years. In most cases, consultancy companies advised the government to do this. But it is not useful to follow trends when companies in the private sector have already developed new strategies to adjust for errors. I decided to analyse and compare the current IT outsourcing strategies of large companies in the private sector and the police force to determine whether IT outsourcing practise in the police needs to be optimised. A lot of changes had to be made in the structure of this police organisation by 2011, but at this point I started my research with the question:

Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
1.3. Aims and objectives

The main aims of the research are as follows:

- To understand the difference between governance of private companies and public services.
- To develop a robust research framework and research model.
- To determine the current IT outsourcing practice in other large organisations. This will make it possible to identify current trends in this field, compare them with current police practice and determine which successful strategies could be adapted for the police.
- To determine the current status of the IT in the North Rhine-Westphalia State Police and to analyse its IT strategy and IT governance.
- To determine the effectiveness of police IT strategies and IT governance in comparison to those of large private companies.
- To determine whether IT outsourcing practice in the examined organisations always leads to the optimisation of costs, processes and customer satisfaction in their core business.
- To determine how satisfied internal customers are with the current setup and how the IT could be optimised from their point of view.
- To determine whether IT sourcing strategies are robust from a data security perspective.
- To determine the current IT problems of the NRW police.
- To determine whether the planned and used models are appropriate and how effective they are compared with other solutions.
- To determine how the current IT strategy of the NRW police could be improved.
2. Literature review

2.1. Introduction

The literature review should underpin all parts of the research, but particularly the methodology and data analysis. The following literature review covers the following topics:

- corporate governance
- governance in the public service
- IT governance and the COBIT framework
- ITIL framework, ISO 27001 and BSI standards
- general information about IT outsourcing
- nine core IT capabilities framework
- conclusions from the literature review

As an outsider, it was not immediately clear how corporate governance, governance, IT governance and IT outsourcing fit together. The research questions already said that I compared IT outsourcing strategies and IT governance of the NRW police and private companies. The chapter on corporate governance provides an overview of how efficiently management maximise value within a private company. In contrast, the chapter on governance within public services shows how public administration can maximise public value.

The chapter on IT governance with the COBIT 4 framework (ITGI, 2006) was the basis for the research framework used in the methodology section. The IT governance is also used by private companies and public organisations. In this chapter are also the other standards and frameworks ITIL, BSI and ISO 27001 described in comparison with COBIT.

In the large chapter on IT outsourcing, I described the terminology used in accordance with Jouanne-Diedrich’s (2006) diagram of IT sourcing dimensions. In the methodology section I combined the COBIT framework with the nine core IT capability framework from Lacity and Wilcocks (2001). The literature review describes all the essential parts of the framework. Chapter 2 ends with the conclusions from the literature review, which will influence further research.
2.2. Corporate governance

One part of the research question involves determining whether IT governance strategies from large private organisations would be practical for the NRW police. IT governance is a part of wider governance. This chapter describes how governance in private companies works. These definitions and explanations of governance in private companies are necessary to understand IT governance in later chapters. This was important to develop the research framework and the later used research model. Rechkemmer (2003) defined corporate governance as the efficient management and control of shareholder organisations by their managers with the aim of shareholder value maximisation.

In contrast to this is the OECD’s (Organisation for Economic Cooperation and Development) definition from 1999: “The system by which business corporations are directed and controlled.” There are many more definitions for corporate governance in literature but this would break the scope of the thesis. In the following, behind general information about this topic and the difference between the Anglo-American and German corporate governance are described and analysed. The OECD (1999) developed the principles of corporate governance and these standards should be voluntary used by the different countries. According to Rechkemmer (2003), Germany established a state commission in 2000 which developed and published the corporate governance codex for German firms in 2002. This codex should be used by the approximately 15000 shareholder organisations and the over 750000 GmbH in Germany.

Furthermore, Rechkemmer (2003) wrote that the corporate governance quality in the DAX firms (German stock exchange) was proved by a ranking in the year 2000. But up to now a scorecard for corporate governance in German firms has not yet been established. In the last years, corporate governance has been discussed heavily in literature. Sternberg (2003) said that it is an illusion that German and Japanese models are, at the moment more efficient because the rights of the shareholders are limited and in the long-term the Anglo-American model of shareholder value maximisation will be superior.
Furthermore, she argued that the use of a modified and improved stakeholder model could be sensible to avoid crises in the future. But Malik (2002, 2008) wrote that all corporate governance models are the result of missed chances and misunderstood liberalism. The stakeholder model from the fifties which was used over forty years was replaced by the shareholder model and this showed its weaknesses during the financial crises in the last decade. Malik (2008) explained further that Drucker’s model of corporate management from 1946 and the use of an improved corporate capitalism model is more effective than the current codex for German companies. He argued further that the shareholder value maximisation model was developed for shareholder organisations but these count only for 30% of all economic power in Germany because the rest is produced by the Mittelstand which consists of medium-sized and small companies.

Even large companies like Bertelsmann, Aldi, Lidl, Miele, Bosch and a lot of others belong to foundations or families and have no shareholders. Many of these companies have a leading market position or are the market leaders. They have their own management codex which they have used successfully for decades independently from all crises in the past (Malik, 2002). Crouch (2011) defined firms not simply as companies but as a concentration of power. In the last decades the Anglo-American model of a company has grown. This means that the company’s power is concentrating on a single manager who is only responsible to the firms’ shareholders (Crouch, 2011). In the last century the European saw companies not as an institution but only as a device to exploit employees and to earn profits for their owners. This phase was influenced by the Keynesian paradigm and was assisted by the leading parties through a macroeconomic policy. Ideas of the neoliberals emphasise the microeconomics and ignore the problems of the companies (Crouch, 2011).

In the seventies, during the inflationary crisis, the Keynesian paradigm seemed outdated because the markets became unpredictable through the faster technological development, global competition and changing customer demands (Crouch, 2011). Crouch (2011) also stated that the shareholder maximisation is not the only form of capitalism and he further argued that in Germany, France and Japan firms also follow other responsibilities and aims like customer-, employees- and national interest or social communities.
In 1990 these models were sorted out because the Anglo-American model of maximisation became superior. Corporate responsibility is a political theory of a firm. The neoliberal Friedman (1970, cited in Crouch, 2011) argued, that a firm has the aim of shareholder maximisation and not the right to decide wider social goals. If firms do not follow shareholder maximisation value they will become inefficient. I conclude that companies are a concentration of power independently from their form of business organisation. The principle of shareholder maximisation value is useful for stock-listed companies. Privately owned firms can also uphold wider social goals if they are profitable. In general, companies have the core objective to make profit and increase market shares to survive in the market.

2.3. Governance in the public administration

One part of the research question involves determining whether IT governance strategies from large private would be practical for the NRW police. IT governance is a wider part of governance. Previous chapters have described how governance in private companies works. The next logical step to underpin the research question is to define governance in the context of public administration. These definitions and explanations of governance in public service are necessary to understand IT governance in later chapters. This is an important part of developing the research framework and the research model.

Moore (1995) published his new ideas in contribution to public management theories and practice in his book “creating public value”. At this time it was clear, that these ideas had not been adapted from current management theories and academic research. Moore developed this from his long-term experience in teaching and his commitment in the public service. In 2011, Moore et al. published a new book with the title “public value theory and practise” that was used in my research. This book is a guideline to create public value in practise based on his theory from 1995. But his book created a new academic debate about management in public administration.
Talbot (2009, cited in Moore et al., 2011) argued that the term public value was following a fashion, but now scientists from philosophy, psychology, ecology, management and political disciplines are analysing and researching public value in Anglo-Saxon regions and continental Europe. Scientists from philosophy focused their critiques on sources of value and public goods. These scientists (Bozemen, 2002; Kernaghan, 2003) categorised and defined public science values and cases by their failure. Furthermore, they researched the hierarchies of public values and competing values.

But they spoke from public values independently from Moore’s public value in singular, although Van der Wal and Vanhout (2009, cited in Moore et al., 2011) and also Davis and West (2008, cited in Moore et al., 2011) saw these as separate literatures. Morrell criticised the idea of public value from the viewpoint of philosophical definitions of public goods combined with economic and political questions about management and governance in the public service. Davis and West linked public value with Latour’s actor network theory and Boltanski and Thevenot’s new pragmatism theory. The authors above showed in different ways that the whole environment including political and daily practise and further material and technical equipment must be analysed in research (Moore et al., 2011).
This also meant that the questions value should not be reduced to abstract terms. Moore et al. (2011) also analysed the robust and critical articles in science journals which were published by Rhodes and Wanna (2007). In the following they criticised seven points regarding Moore’s public value theory. For them it is not clear, if the findings were proved by empirical and normative research. The inconsistent definitions of the public managers were only practicable in the USA and not in the UK because there is a clear separation of the tasks of elected politicians and public managers.

Entrepreneurial public managers influence the content of elected parties and politicians and weaken their positions. According to Rhodes and Wanna (2007) a single manager should not influence the democratic process, where the parties find compromises between competing and conflicting interests. Furthermore, the theory of public value is strongly orientated on the private sector although they have different goals and requirements. In Moore’s (1995) public value theory the regulation of the state and the relationship between citizens, interest groups and state officials are not recommended.

Alford (2008, cited in Moore et al., 2011) criticised Rhodes and Wanna in an article in the same journal where they published their findings. For him, Rhodes and Wanna misrepresented and misunderstood Moore’s arguments and theory. They used themselves outdated theories from the relationship of politics and administration. Rhodes and Wanna (2009) responded to Alford’s criticism. They emphasised that in the USA the political power is divided by the different state governments and furthermore, it is not centralised like in the Westminster style democracy. This means that the ministers in the UK are preeminent actors with a high responsibility and must not compete with many other actors. They concluded further that there is a great danger if one single minister makes the wrong decisions (Rhodes and Wanna, 2009). In these journal articles, they repeated their criticism that Moore’s public value is a utopian idea ignoring the reality of the dark side of government like regulations for example. Furthermore, they argued that the role of public managers according to Moore’s theory weakens the political power of elected parties and politicians.
This debate also animated the British scientists Gains and Stoker (2009, cited in Moore et al., 2011) to characterise public value as new paradigm to create a conceptual and practical framework of networked government. Moore’s book from 2011 is a collection of articles of other authors concerning public value. They concluded, in his article on this book, that public value can provide a new paradigm if the triple bottom line approach is used. This means that sustainable development is done if the social, environmental and economic issues are interlocking circles that overlap. In his approach Moore (2006) defined, that following institutional economic economy is part of the social-cultural system and that both are embedded in a system of natural resources and ecosystem services. For them each sphere has its own logic, that means that society is shielded by conservatism and the economy is regulated by markets. All these spheres are connected to each other (Moore et al., 2011).

2.3.1. Creation of public value

Moore et al. (2011) defined that public value is not created by the public administration alone, but it can be increased by the voluntary and private sectors, governments as well communities. They see the role of the government as a catalyst to synergise the resources and the power of the state, civil society and the market to realise public goals behind strategic and purpose priorities. In a further article Moore et al. (2011) argued that public value is primarily created on the basis of public administration by the interaction of public service members with communities, citizens and organisations. However, Moore et al. (2011) developed the diagram of public value stream. They also argued that public value creation could be modelled as an open system in which inputs are converted through processes and activities into outcomes and outputs. These outputs and outcomes are produced by active partners or organisations and co-producers. I concluded that the public value provides practical framework to improve and reform the public services. This new concept is more than an alternative to existing outdated public goods and public choice theories.
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2.3.2. Definitions of public goods and public choice

Caplan (1998) defined that a government exists to provide public goods. He further argued that public goods are non-excludable goods for which the people do not have to pay the producers for using them. Friedman (1987) wrote that the pure public goods problem is to force the population to contribute time and money in the form of taxes to assist the government. The government could then use these resources to do things for which they were elected. Friedman (1987) further discussed that people who pay the government to produce public goods that are used by other people, which do not pay for them. The payers derive inadequate benefit from their support; therefore, the right provision of public goods is a problem. Shaw (2018) found that a further problem in a private marketplace is that the people’s main motivation is self-interest.

Public choice theory was developed in the 1950s base on the study regarding taxation and public spending by James Buchanan and Gordon Tullock, for which both were awarded the Nobel Prize in economics in 1986.

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Figure 3: The public value stream (Moore et al., 2011)
Supporters of the public choice theory argue that politicians have some concern for other people but their main aim is self-interest regardless of whether they are politicians, voters, bureaucrats or lobbyists (Shaw, 2018). Many economists have stated that market failures, such as those that give rise to monopolies, require government intervention, whereas public choice economists maintain that government does not solve the problem (Shaw, 2018). She further argued that many public choice economists do not provide an ideological or political position and developed mathematical models, game theories or simulations to understand political situations; instead, public choice focus on how the collective decision-making process itself works.

2.3.3. Networked community governance

In the following is information of how government increases public value by mobilising loyalty and trust within local communities and organisations. Frances et al. (1991, cited in Moore et al., 2011) defined that hierarchies coordinate the state and competition the private market but the society is co-ordinated through networks. Moore et al. (2011) found out that inter-organisational partnerships and networks have a more adaptable response and are more flexible than hierarchies. Furthermore, they could share opportunities and risks better than competitive markets, even if they change quickly and are complex. They further argued that the development in communication and information technologies allows new possibilities for networked governance. This also allows the public administration to involve citizens, communities and users better, although the advantages and opportunities of networks are limited by instability and volatility (Moore et al., 2011).

Moore et al. (2011) argued that the new paradigm of networked community governance could be characterised as a change of governance from state and market towards civil society. There is further a change from regulations by exits and voice towards regulation by loyalty. The coordination by hierarchies and markets changes towards coordination through networks. They further defined that the neo-liberal model of new public management (NPM) concentrates on the relationship between the state, consumer and private market. Moore et al. (2011)
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<table>
<thead>
<tr>
<th>Traditional public administration</th>
<th>New public management</th>
<th>Networked community governance</th>
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<tbody>
<tr>
<td><strong>Context</strong></td>
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<tr>
<td>Stable</td>
<td>Competitive</td>
<td>Continuously changing</td>
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<td><strong>Population</strong></td>
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<tr>
<td>Homogeneous</td>
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<td>Diverse</td>
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<tr>
<td><strong>Needs/problems</strong></td>
<td></td>
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<tr>
<td>Straightforward; defined by professionals</td>
<td>Wants, expressed through the market</td>
<td>Complex, volatile and prone to risk</td>
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<tr>
<td><strong>Strategy</strong></td>
<td></td>
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</tr>
<tr>
<td>State- and producer-centred</td>
<td>Market- and customer-centred</td>
<td>Shaped by civil society</td>
</tr>
<tr>
<td><strong>Governance through</strong></td>
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<tr>
<td>Command and control hierarchies</td>
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<td><strong>Regulation by</strong></td>
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<tr>
<td>Voice</td>
<td>Exit</td>
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<td>Public servants</td>
<td>Purchasers and providers clients and contractors</td>
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<td><strong>Theory</strong></td>
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<td>Public goods</td>
<td>Public choice</td>
<td>Public value</td>
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Table 1: Public value and networked community governance (Moore et al., 2011)

In contrast to this is the networked community governance (NCG), which focuses on the relationships between citizens, civil society and the state. In the post war society the political ideology of the different parties polarises on the hand, the left parties were calling for public regulations and on the other hand, the conservative parties were calling for privatisation of the public administration. In this competition between these two spheres, the third one, the civil society has been forgotten. But since the democratisations in North Africa and Eastern Europe we see the powerful influence of civil society. (Moore et al., 2011)
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Hirschman (1970, cited in Moore et al., 2011) said that the state is regulated by the citizens’ voice in form of elections or pressure group activities. In his concept the consumers regulate the markets by choice or not choice (exit). At last, loyalty and trust regulate the civil society.

Figure 4: Three nodes of networked governance (Moore et al., 2011)

2.3.4. Key definitions of the role of a public manager

In the following the role of the public manager is defined in contrast to a manager of a private enterprise. In general there are many parallels between both because they control assets, try to do a good job and manage their resources effectively using their administrative skills and experience (Moore et al., 2011). In the case of private managers the assets are contributed by the investors or owners. But in the case of public managers the assets are contributed by citizens and tax payers. Furthermore, both use the same instruments to lead the staff, for the realisation of their goals and optimisation of production processes and resources (Moore et al., 2011).

They try to reach their aims with the same particular set of technological possibilities and environmental conditions. I concluded from this, that the job of the managers’ daily work in the different institutions does not differ too much. But the key difference between them is, by definition, that public managers have a sovereign authority of the state as an asset which they can use to reach their aims. Sometimes they use this authority directly, for example, in the case, that someone violates the law (Moore et al., 2011). Moore et al. (2011) defined the tasks of the public service from the view of the citizens as a possible customer.
The individual citizen uses the service of the public services as an end consumer but the state has a higher responsibility for its product than a private company. So therefore the benefit for the individual is also equal or higher than in comparison to that of a private firm to its customer (Moore et al., 2011).

I concluded further that the customer’s life is improved through an effectively working public administration. At this point Moore et al. (2011) quoted, that the hypothetical model of a public service customer has two differences in contrast to the customer in a free market. The first reason is that all costs are paid through the tax system; this means that the customer pays nothing or not the full price for the service. So the price which is paid by the customer could not be used to measure the value of the product or the efficiency of the public service. The second reason is that there is no loss for the producer if a customer is not satisfied or does not use the service further. In most cases the customers has no choice because he must use the product or the service of the government and this also influences actions of the public service managers (Moore et al., 2011).

At this point Moore et al. (2011) argued that if we define the value of the product, which is produced with the tax money, the decision lies with the political body and not in the public service. The public service should see the political body also as a customer. The political body wants the realisation of political aims or social outcomes which allow the use of the taxes. There are two forms of intermediaries between supplier and customer. In the first one we have a buying unit and in the second one we have the intermediate organisations as retailers in a supply chain (Moore et al., 2011).

This means for the public service that there are organisations, that fulfil this role but it is clear that this concept is not fully adaptable to the public service. The public service is not just a service which helps the customer but it should try to get the customer to produce the value, which the political body wants to create with the used assets. They further found out that the public value is not the summation of individual satisfactions. (Moore et al., 2011)
We should evaluate the efforts of public sector managers not in the economic marketplace of individual consumers but in the political marketplace of citizens and the collective decisions of representative democratic institutions (Moore, 1995:31).

Moore et al. (2011) published a diagram of the public value dynamic which builds explicitly on Moore’s strategic triangle. Moore’s public value theory is identified by the three interdependent activities authorisation, creation and measurement. The creation of public value depends on these three activities (Moore et al., 2011). In this diagram the issue of measurement is critical to the creation of public value.

The literature review explained Moore’s public value theory in comparison to private value. The theory of networked community governance is a new paradigm which can be used to modernise and optimise public services. It is important to understand that governance in private companies and public services works differently. The study attempts to prove whether Moore’s theory (1995, 2011) is appropriate for the NRW police.
2.4. IT governance

One part of the research question involves determining whether the IT governance strategies from large private organisations would be practical for the NRW police. IT governance is a part of wider governance. Previous chapters have described how governance in private companies and the public service works. The next logical step to underpin the research question was to define IT governance on the basis of the COBIT governance framework. COBIT is the widely used framework for IT governance in private companies and public organisations. This is an important part for developing the research framework and the research model.

Johansen and Goeken (2007) explained that the definitions for IT governance differ from each other strongly. The IT Governance Institute (2008) defined IT governance as the responsibility of directors and executive management. IT governance belongs to governance and consists of processes, organisational structures and leadership that guarantees that the IT used supports the organisation's objectives and strategies.

Haes and Grembergen (2004, p.6) emphasised in their definition of IT governance the organisational abilities which management uses to reach their strategic aims: „IT governance is the organisational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT. “

In contrast to this is the definition of Weill and Ross (2004). They argued that IT governance is not making decisions because this is part of the organisation’s management. IT governance defines who is allowed to decide and support the findings of decisions. Rueter et al. (2006) wrote that the IT strategy is one of the core instruments of IT governance and it is driven by the business and not by the IT. IT strategy must find a prioritisation of trends and challenges in the IT and business aims and value in a timeframe of three to five years. In this chapter are also the other standards and frameworks ITIL, BSI and ISO 27001 described in comparison with COBIT.
2.4.1. Strategic alignment

The strategic alignment covers the relationship between business strategy and IT strategy. Furthermore, it coordinates the IT activities and the company strategy (ITGI, 2003; Gilling, 2009). The main aim of every IT activity is the maximum assistance of the company’s business strategy and inversely the IT strategy (Gaulcke, 2010). The most important instrument of strategic alignment in the IT is the IT strategy. This must consider the market conditions, the company’s aims and the IT conditions which consist of IT infrastructure, IT capacity, application architecture and IT costs (Gaulcke, 2010). According to COBIT, the IT strategy is controlled and developed by the IT strategy committee which is supervised by the company’s board of managers. This committee judges IT activities and investments and therefore it is the most important institution in large companies for IT strategies (ITGI, 2003; Gaulcke 2010). According to COBIT, companies should also have an IT steering committee which consists of members of the IT -, business – and top management. This committee is the control unit which defines the priority of IT investments in coordination with the company’s strategy (Gilling, 2009).
Furthermore, this committee controls and monitors the status of IT projects, service optimisations and the fulfilment of service and operational level agreements (ITGI, 2003; Gaulcke, 2010). A further committee, according to COBIT, is the IT architecture board which defines and controls IT architecture guidelines. This committee guarantees that the IT architecture assists the company’s strategy and considers risk management requirements and the compliance to these (ITGI, 2003; Gaulcke 2010).

2.4.2. Value delivery

Value delivery is time and budget conform to the required IT services throughout the whole delivery cycle which delivers the maximum benefits at the lowest costs for a company (ITGI, 2006; Gilling, 2009). Current studies have proven that IT investments have a higher yield potential than conventional investments (ITGI, 2005b). Gaulcke (2010) argued that value delivery could be produced in many different ways, therefore, it is very difficult to measure this in practice in a company’s IT. Gaulcke explained further that value delivery requires two basic conditions. Firstly, the IT must assist the company business aims and satisfy its requirements and secondly the task responsibilities between IT and business must be clearly defined.

It has to be clear which role the IT should have in the company, i.e., is it an assisting or a catalysing factor for the business success? According to ITGI (2006) and Gilling (2009) the effectiveness and efficiency depends on the IT maturity levels. This means, that the status of the IT processes must be measured and classified according to the COBIT maturity scale. Furthermore, it is important for a successful value delivery that business and IT service providers have to work together closely. The decision making and the responsibilities for sourcing decisions should be shared between IT management and business (ITGI, 2006; Gilling, 2009).
2.4.3. Risk management

Risk management covers operational IT risks, data security and the continuous stable production of the IT services. Efficient IT risk management depends on the transparency of IT risks, clear task responsibilities and high integration of risk management in the company (ITGI, 2008; Gaulckes, 2010). According to ITGI (2006), risk management covers the value of preservation processes. ITGI (2004) researched the main risks for the IT in companies and found out that data security is the most important thing before stability risks, IT infrastructure risks, IT investment - and project risks (ITGI, 2005d). The internal control requirements and the responsibilities to customers, stakeholders and shareholders are the main reasons for continuous integration and optimisation of IT risk management in the companies (ITGI, 2006).

According to ITGI (2006) IT risk management must be a revolving and consistent optimisation cycle which starts with the identification of risks, vulnerabilities, threats and costs. If the risks are clear, solutions and process will be defined and integrated. At the end of this optimisation the performance of this process should be a clear improvement and avoidance of risks which should be measured and monitored (ITGI, 2006; Gilling, 2009).

2.4.4. Resource management

Resource management includes dealing with such issues as investments and the management of critical resources which contain, according to COBIT applications, infrastructure, information data and employees. A good resource management is very important for the IT governance focus area value delivery. In short IT resource management is the optimisation of knowledge and infrastructure. (ITGI, 2003; Gaulcke, 2010) According to Gaulcke (2010) the largest parts of the IT budget is used for the IT production which is for the high staff costs. Therefore, the key issue of resource management is staff recruitment and development. After the external and internal staff resource management, service contracts, software and hardware and licenses are important parts of this IT governance focus area (ITGI, 2003; Gaulcke, 2010).
According to ITGI (2012) and Gilling (2009), resource management also covers issues like trusted suppliers, outsourcing models and the skills of the service providers which are evaluated using evaluation criteria derived from the company’s critical business success factors and strategic aims. The aim here is the leverage of internal and external skills and knowledge to fulfil the company’s requirements. Furthermore, Gilling (2009) wrote that a good resource management also guarantees that an integrated, economical infrastructure is provided and technology is updated, replaced or integrated according to the required business aims.

2.4.5. Performance measurement

Performance measurement covers the continuous control of strategic IT activities including the use of IT resources, IT projects, IT services and processes (ITGI, 2008; Gaulcke, 2010). The other focus areas of IT governance strategic alignment, value delivery, risk management and resource management are useless if they are not controlled by monitoring measurements. The performance measurements include assessment and audit activities and continuous measurements. The results of this assessment influence all other IT governance focus areas because corrective processes and activities are initialised from here (Gilling, 2009; ITGI, 2012).

According to Gilling (2009) the performance measurement should involve the financial-, customer-, internal – and learning perspective to satisfy shareholders, stakeholders, customers and the company’s needs and requirements. COBIT assists in this focus area of IT governance model in many different ways with aims. The ITGI (2004) started research to find out how the benefits in the IT could be measured. In the financial area the calculation of capital yield is the method used the most after the balanced scorecard (BSC) method. The ITGI (2012) wrote on their website that the BSC is one of the most effective means to help the management and the board of directors to achieve business and IT alignment. Things which are not or are difficult to measure like customer satisfaction, creation of operational efficiency, streamlining of internal functions and the deployment of staff skill are considered using BSC. In this way the management can link long-term strategic objectives with short-term activities.
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Figure 7: Overall COBIT framework (ITGI, 2007)
2.4.6. COBIT in comparison with ITIL

Krisanthi et al. (2014) stated that the COBIT framework was developed as a tool for audits because it defines business objectives related to in the organisation existing IT activities. This framework delivers information to measure, organise and control IT processes. In COBIT every IT goal can be mapped to several related IT processes and vice versa. Krisanthi et al. (2014) further argued that COBIT is more effective than ITIL in measuring of the maturity of each IT process and the optimisation of the future process by comparing the maturity achievements that leads to improvement.

In contrast to this observation, Krisanthi et al. (2014) found that ITIL comprises best practise guidelines to plan, design and implement powerful service management solutions in fast changing and complex IT environments. ITIL’s best practise methods are detailed instructions to improve the maturity of IT processes which are required to achieve IT control objectives from COBIT. ITIL focuses on best practise solutions to optimise service strategy, IT process flows and IT methods.

I conclude that ITIL is more effective on the process level and COBIT is stronger in area of IT governance. COBIT is more used in North-America and ITIL is used worldwide. However, I agree with Huang et al. (2009) and Krisanthi et al. (2014) that COBIT focuses on how the maturity of IT processes could be measured and also how information is provided to fulfil business requirements. ITIL delivers best practise guidelines for IT management and processes. These guidelines are necessary and effective to document and improve IT processes in fast changing IT environments. In my research I tried to use ITIL instead of COBIT but ITIL focuses more on processes.

My study does not aim to pursue on the process level of every single process because this approach is beyond the scope of my thesis. At this point, finding a tool to generalise the information was sensible because I only wanted an overview of the efficiency of the IT operations in the subject organisation. The nine core IT capabilities framework proposed by Lacity and Willocks (2001) was the solution to this problem. If I can determine the strength of the core capabilities in the subject organisations I can evaluate the efficiency of its entire IT environment. Then, I can integrate the results into the COBIT IT governance cycle. ITIL is explained in section 2.4.8.
2.4.7. Combine COBIT with the nine core IT capabilities framework

I used the COBIT framework to structure the IT governance at the subject organisation. COBIT was also the basis of the interview questions but evaluating the maturity of every process used in the IT governance of the subject organisation was necessary. COBIT uses a level scale from 0 to 5 to evaluate the maturity of the various processes, but this method was not applicable to every process in this study. The reason is the possibility that the respondent may not know the exact level of the process or may provide false answers or not provide so detailed information. My study does not aim to pursue on the process level of every single process because this approach is beyond the scope of my thesis. COBIT involves 34 main processes and in a large organisation, hundreds of various processes constitute a single main process. For example, the main process employed by the NRW police to “define and manage service levels” consists of hundreds of service levels for all IT applications and external and internal service providers. At this point, finding a tool to generalise the information was sensible because I only wanted an overview of the efficiency of the IT operations in the subject organisation. The nine core IT capabilities framework proposed by Lacity and Willocks (2001) was the solution to this problem. This framework is explained in chapter 2.6.. If I can determine the strength of the core capabilities in the subject organisations I can evaluate the efficiency of its entire IT environment. Then, I can integrate the results into the COBIT IT governance cycle.

2.4.8. Information technology infrastructure library (ITIL)

All of the following information was obtained from the official website www.axelos.com. Axelos was founded in 2013 as a joint venture between Capita Plc. and Her Majesty’s Government in the United Kingdom. The company’s mission and vision “unites and inspire us in a common coherent strategic direction, showcasing us as a company that is always looking forward to the next thing in best practise, new products with real reference to all – whatever the company, whatever the geography” (Axelos, 2018).
The main aim of Axelos is to offer and develop the best practise portfolio including the frameworks ITIL, PRINCE2, Managing Successful Programmes (MSP) and RE-SiLIA. The RESILIA portfolio offers training and a toolbox to implement, improve and ensure global best practise in cyber security. PRINCE2 is a guide to implement, manage and control any complexity and size. MSP is a structured framework for programme management for all organisations and companies to optimise services, practises and effectivity for the future. (Axelos, 2018)

ITIL is the most widely accepted standard for service management worldwide. It is an effective framework with best practise solutions for the service requirements of any organisation to manage business changes, growth and transformations. ITIL IT service management (ITSM) helps the organisation to work as a service provider which fulfils all business needs. Thus, the IT department is no longer separated from the wider organisation and their symbiotic interrelation is emphasised. The organisations can use the best practise framework without the development of its own ITSM. This is a key benefit in fast changing market conditions with short cycle times. Many experts and organisations influenced and developed ITIL through their knowledge and experience in a close collaboration. Therefore, ITIL was not developed from a single organisation or specific process. The framework is globally accepted and understood and can be easily adapted and communicated in every organisation or company. ITIL is also compatible with all current frameworks such as COBIT and ISO standards. (Axelos, 2018)

The ITIL best practise framework consists of five core aspects which cover the complete IT service cycle:
- ITIL service strategy,
- ITIL service design,
- ITIL service transition,
- ITIL service operation, and
- ITIL continual service improvement.

ITIL uses a maturity model to analyse the maturity of the IT service processes for the optimisation of the IT service management within the entire ITIL framework. (Axelos, 2018)
Key benefits of ITIL

ITIL delivers a robust best practise framework for planning, identifying, supporting and providing IT services in all organisational and business environments. The best practise guidance comprises the complete service cycle from designing, identifying and implementing IT solutions to the continuous review and optimisation of the IT environment.

- ITIL helps to manage service disruptions, failures or business risks.
- ITIL optimises the customer relationship by providing optimal services which effectively fulfil all customer requirements.
- ITIL helps to implement cost effective systems to manage the organisation’s services.
- ITIL supports business changes without any problem for the productive service environment.

(Axelos, 2018)

My research would investigate if the organisations used the important ITIL framework to document and structure their IT environments. At this point, I have to find out how far the organisation has come with the introduction of ITIL and how mature are the IT processes of the entire IT environment. Implementation is an indicator of how fast and effective the IT departments work in the subject organisations.

2.4.9. Federal Office for Information Security

All of the following information was obtained from the official website www.bsi.bund.de of the Federal Office for Information Security (BSI) under the Federal Ministry of the Interior (BMI) of Germany. BSI is a neutral organisation that deals with all issues related to IT security. It is located in Bonn and has over 700 employees. The authority has four specialised and one special departments. The departments are organised in three divisions which consist of various sections. (BSI, 2018)

The BSI provides the network information security (NIS) policies and also controls its implementation in Germany. These policies serve as a legal framework to guarantee cyber security in Germany according to the policies of the European Community.
The BSI receives from the BMI new tasks and authorisations to supervise and control if the necessary requirements and reporting obligations for critical IT infrastructures are fulfilled. The BSI establishes Mobile Incident Response Teams (MIRT) to assist companies with IT security specialists in case of critical IT incidents and cyber-attacks. The BSI provides the baseline security framework to improve the IT security in of organisations and companies. The baseline IT security also has an international reputation due to its compliance with ISO 27001/27002 for IT security. (BSI, 2018) The BSI standard 200-1 defines general requirements to manage systems for IT security (ISMS) and its compatibilities with ISO 27001/27002. The BSI standard 200-2 is the basis of the BSI methods to build up an ISMS. The standard establishes three new procedures to implement the baseline IT security. The BSI standard 200-3 comprises all risk related procedures for the implementation of the baseline IT security. This standard is useful for organisations which already work successfully with the baseline IT security methods. They can start the risk analysis immediately after the baseline IT security analysis. The BSI standard 100-4 is the final step in the baseline IT security and it defines procedures for IT emergency management. However, the BSI provides the GS tool which is already used by the CISOs of the NRW police. The CISOs employ this tool to document the complete IT infrastructure and procedures in a database according to the BSI baseline security guidelines. The NRW police has to fulfil these guidelines in accordance with the current law. In my study, I will also consider if the research organisation has already implemented the BSI guidelines in accordance with the current law. Implementation is an indicator of how fast and effective the IT departments work in the subject organisations.
2.4.10. ISO 27001/27002

All of the following information was obtained from the official website https://www.iso.org. The International Electrotechnical Commission (IEC) and the International Electronical Commission (ISO) are responsible for enforcement of the system for worldwide standardisation. They are assisted by specialists of national bodies and organisations in evolving international standards.

In all fields non-governmental and governmental organisations work together to develop standards in accordance with the ISO/IEC guidelines. IEC and ISO implemented the Joint Technical Committee (JTC) which is responsible for standardisation in the field of IT providing the developed standards to national bodies. If 75% of the national bodies vote for the acceptance of the standard it is approved and ready for international use. The JTC is not responsible for the compliance of any used patents. (ISO, 2018)

ISO 27000 family references an information security management system with related terms and definitions. ISO 27001 describes the information security management system requirements and ISO 27002 provides the code of practise for information security controls. ISO 27003 is a guidance of information security management and ISO 27004 describes the monitoring, measurement, analysis and evaluation in the information security management. Other standards exist in this family, but the ISO 27001/27002 certification is important for organisations to fulfil national IT security requirements. (ISO, 2018)

ISO 27001 was designed as a standard for the organisation to implement an Information Security Management System (ISMS) or as a reference for the introduction of information security controls. In accordance with the ISO 27001, the ISMS provides a coordinated overview of specific security risks faced by an organisation. ISMS also shows how information security controls could be integrated in the overall framework of the organisation’s own management system. (ISO, 2018)
ISO 27001 covers the three main sources of IT security requirement.

a) The assessment of risks covers all risks in an organisation.

b) All statutory, statuary and control requirements of an organisation are comprised in this IT security standard.

c) The standard also comprises the business requirements of all IT processes in an organisation, for example, communication, archive and production.

The use of this standard is only successful if it is supported by all employees, the management, shareholders and service providers.

The ISO 27001 standard can easily be combined with the frameworks and security standards of an organisation to fulfil business and national requirements. (ISO, 2018)

The ISO 27001 standard provides guidelines for the design of organisation specific controls. This task depends on the criteria for the general risk management approach, the risk treatment options and the risk acceptance. The controls in this standard can be used as a guide for information security in most organisations. The standards have to be adapted to fulfil national and organisational requirements. The lifetime of the standards and controls is limited by the fast innovation speed in IT. Therefore, the current version of this standard should always be implemented in the organisation. (ISO, 2018)

In my study, I will also consider if the research organisation has already implemented the ISO 27001 standard. Implementation is an indicator of how fast and effective the IT departments work in the subject organisations.

2.4.11. Combining COBIT, ITIL and ISO 27001 frameworks

In the last decades several groups and organisations developed well-known and accepted IT governance standards and frameworks such as BSI, COBIT, ITIL and ISO 27001. Krisanthi et al. (2014) developed an IT framework for a governance audit by combining the COBIT and ITIL frameworks. Huang et al. (2009) developed a new IT framework by aligning COBIT 4.1, ITIL v3 and ISO 27001 which are widely accepted and effective frameworks or standards for IT control and practises.
Both scientist groups used the strength of each framework or standard to create highly efficient IT frameworks. Huang et al. (2009) and Krisanthi et al. (2014) stated that COBIT focuses on a general IT control to provide information to fulfil business requirements. They wrote that ITIL delivers best architecture and practise guidelines to guarantee that IT processes closely assist business processes and also provides appropriate and strong business solutions. Huang et al. (2009) also wrote that ITIL and COBIT correspond to each other. Krisanthi et al. (2009) found that ITIL and COBIT, by complementing each other, are effective frameworks to understand the priorities and needs of IT governance. Krisanthi et al. (2014) stated that the COBIT framework was developed as a tool for audits because it defines business objectives related to in the organisation existing IT activities.

This framework delivers information to measure, organise and control IT processes. In COBIT every IT goal can be mapped to several related IT processes and vice versa. Krisanthi et al. (2014) further argued that COBIT is more effective than ITIL in measuring of the maturity of each IT process and the optimisation of the future process by comparing the maturity achievements that leads to improvement. In contrast to this observation, Krisanthi et al. (2014) found that ITIL comprises best practise guidelines to plan, design and implement powerful service management solutions in fast changing and complex IT environments. ITIL’s best practise methods are detailed instructions to improve the maturity of IT processes which are required to achieve IT control objectives from COBIT. ITIL focuses on best practise solutions to optimise service strategy, IT process flows and IT methods.

The following examples show how the various processes of both frameworks could be combined. Both scientist groups used the method of mapping the processes from COBIT towards ITIL. Detailed explanations of various processes in the examples are beyond the scope of this thesis. The examples only show how ITIL and COBIT can be combined to develop a highly effective customised framework which fulfils all the business requirements of an organisation.
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Thesis from Uwe Blind

<table>
<thead>
<tr>
<th>IT Objectives (COBIT)</th>
<th>Activities (ITIL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI3.2 - Infrastructure resource protection and availability</td>
<td>SD 4.6.5.1 - Security controls SO 5.4 - Server management and Support</td>
</tr>
</tbody>
</table>

Table 2: Combining COBIT and ITIL (Huang et al., 2009)

<table>
<thead>
<tr>
<th>IT Objectives (COBIT)</th>
<th>Activities (ITIL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO2 - Define the information architecture</td>
<td>SD 3.6 - Design aspects</td>
</tr>
<tr>
<td>PO3 - Determine technological Direction</td>
<td>SD 3.6.3 - Designing technology Architectures</td>
</tr>
<tr>
<td>AI2 – Acquire and maintain application software</td>
<td>SD 3.6.1. – Designing service solutions SD 5.3 – Application management</td>
</tr>
<tr>
<td>AI5 – Procure IT resource</td>
<td>SD 4.7.5.3 Establishing new suppliers and contracts</td>
</tr>
</tbody>
</table>

Table 3: Combining COBIT and ITIL (Krisanthi et al., 2014)

According to Huang et al. (2009), the ISO 27001 is the best standard of information security management. The ISO 27001 guidelines aim to fulfil the COBIT goals of IT control objectives. The following example maps the COBIT control objectives, ITIL activities and ISO 27001 practises.

<table>
<thead>
<tr>
<th>Acquiring technology infrastructure</th>
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<tbody>
<tr>
<td>IT objectives (COBIT)</td>
</tr>
<tr>
<td>AI3.2: Infrastructure Resource Protection and Availability</td>
</tr>
</tbody>
</table>

Table 4: Combining COBIT, ITIL and ISO 27001 (Huang et al., 2009)
I agree with Huang et al. (2009) and Krisanthi et al. (2014) that COBIT focuses on how the maturity of IT processes could be measured and also how information is provided to fulfil business requirements. ITIL delivers best practise guidelines for IT management and processes. These guidelines are necessary and effective to document and improve IT processes in fast changing IT environments. The findings of Krisanthi et al. (2014) could help for other organisations to combine their IT frameworks with COBIT and ITIL. ISO 27001 is the necessary standard to guarantee the security of IT processes. Huang et al.’s (2009) findings could be a reference for other organisations when combining their IT frameworks with COBIT, ITIL and ISO 27001. I conclude from these examples that the COBIT and ITIL frameworks are also flexible and powerful enough to be combined with other frameworks to develop a customised and highly effective framework which fulfils all the business needs of an organisation. All these results can contribute to the further research because effective organisations should combine various IT frameworks and customise them in response to their business needs.
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2.5. Outsourcing

One part of the research question involves determining whether IT outsourcing strategies from large private companies would be practical for the NRW police. IT outsourcing is a strategic part of IT governance. Previous chapters have described how governance in private companies and the public service works. The next logical step to underpin the research question is to define IT governance on the basis of the COBIT IT governance framework. The following sections provide background information about outsourcing. This is necessary during the data analysis section to classify the IT outsourcing strategy of the interviewed companies and police authorities. In particular, this background information helps to understand the reasons behind their IT outsourcing strategies.

The following literature review covers of the following topics:

- Forms of outsourcing
- Areas in which German companies outsource
- Outsourcing activities in large German companies
- Reasons for outsourcing
- Outsourcing complexity
- IT outsourcing market volume
- Resource-based view

2.5.1. Forms of outsourcing

In literature the terminology of sourcing derivate is not clear, this makes the orientation more difficult. For this purpose, Jouanne-Diedrich (2006) developed the following diagram. This is only an attempt to categorise the different terminology and therefore, it is not complete and other authors might have a different opinion about this topic. In the following outsourcing is viewed more from the practical perspective. In the past decades many forms of sourcing has been developed as variants and alternatives of outsourcing. According to the diagram figure 8, outsourcing can be separated into the following dimensions.
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Timeline

With the focus on the timeline for example the process of outsourcing projects is subdivided in insourcing, outsourcing and backsourcing.

Insourcing

In the literature most authors define the strategy to do all duties and processes of a company internally as insourcing. Furthermore, the takeover of an up to now foreign company is also called insourcing. To this topic also belongs the strategy to centralise IT tasks of all company locations to one large internal vendor. Braeutigam et al. (2009) defined that with the concentration of IT activities in a specialised division in an enterprise, there is strictly speaking no outsourcing, but it is an important and necessary preliminary stage of the final paging of this enterprise area. Thus a cost comparison and offer comparison with external service providers is possible to be able to ascertain in which area outsourcing brings advantages (Braeutigam et al., 2009).
Dibbern and Heinze (2001) defined the term intercompany outsourcing is synonymous with insourcing. This type is also no real outsourcing because in most cases the company build up an internal IT service provider to concentrate IT stuff, responsibilities and know-how. This internal service provider also hosts the datacentre and does all tasks in the information technology which are necessary for the company. Some authors think that even if external vendors work in the companies' location and are integrated in the company structure as low wage staff it can be also defined as insourcing (Braeutigam et al., 2009). A good example is here the Bertelsmann Company which has staff from IT vendor which do the IT hotline and the first level support at the customer's locations (Interview with IT manager from Bertelsmann datacentre, 2009). Insourcing reduces dependence on external suppliers because the company still has the full control and quality can be guaranteed (Ganowski and Joppe, 2009).

**Outsourcing**

In literature the terminology of outsourcing is differently used. Bloese (2006) said that in economy outsourcing defines the transfer of enterprise tasks and structures in a third enterprise. In this foreign relationship contracts fix the duration and the object of achievement. Outsourcing can also be understood as the outplacement of tasks and jobs from the parent company in cheaper subsidiaries (Bloese, 2006). Not only the external procurement of services is looked upon outsourcing, but all activities are meant which lead to an out-tasking of achievements or part productions (Braeutigam et al., 2009).

**Backsourcing**

In literature some authors also define the relocation to the home location of foreign outsourced enterprise areas as backsourcing. The reintegration of previously outsourced processes and functions in an enterprise is called backsourcing (Braeutigam et al., 2009).
Ebert (2006) said that a variation of the backsourcing is given when the manpower whose jobs have been lost by rationalisation are further employed instead of being dismissed due to the fact that the production of parts formerly produced externally is brought back to the enterprise. Reasons for backsourcing are the high amount of IT outsourcing projects in the first year. If an outsourcing project fails, the customer must try to build up their IT department again. Further reasons for failure are, e.g., the high costs for the IT service provider or bad services. Many outsourcing calculations were done with the wrong forecasts or costs were forgotten (Ebert, 2006).

Koehler (2007) argued that other reasons for backsourcing can be high economical or security problems in the vendors’ country. Backsourcing reduces the dependence on external vendors or suppliers, because again bigger parts of the whole production process are done in your own enterprise. Hereby the reliability of the planning increases, also the required quality can be guaranteed (Koehler, 2007).

One interesting example for IT backsourcing is the Bertelsmann Company which sourced out their night shifts work to the fourth largest Indian IT vendor Satyam in 2008. But then they heard news that this Indian vendor falsified their bookkeeping and that they had several hundred million Dollars debts. The result was that they sourced everything back and now only use onshore vendors (Interview with IT manager from the Bertelsmann datacentre, 2009). The newspaper Handelsblatt (2009) wrote that this crisis destroyed the trust of the international customers in the Indian IT vendors and many companies cancelled their contracts. The Indian government gave money and guarantees to the vendors to support the vendors and to solve the crisis.

**Locations**

Depending on the location of the outsourcing service providers the following geographical dimensions can be separated into onsite sourcing, onshore/domestic sourcing, rural sourcing, nearshore outsourcing, offshore outsourcing and global sourcing.
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Onsite sourcing
If the external vendors provide the services at the customer’s company location it is defined as onsite sourcing. As already mentioned this kind of service also belongs to insourcing (Koehler, 2007).

Onshore/ domestic sourcing
In literature the terminology for onshore sourcing, domestic sourcing are used synonymously. In the case of onshore sourcing the service is done by vendors who operate in the customer’s country (Raubenheimer, 2009). Besides, the nearness to the customer has a strategic advantage. A special form of onshore sourcing is rural sourcing, which is where the services are not concentrated at the customer’s location but is divided in rural areas in the customer’s country (Kohler, 2007). Here the wages are lower because there are not too many jobs in these regions. Bertelsmann has its call centres in the rural region around Gutersloh and there is almost nothing else. (Interview with IT manager from Bertelsmann datacentre, 2009)

Nearshore sourcing
The concept nearshore sourcing means the outsourcing in countries with lower wage levels that are near or behind the customer’s country and defines a special form of offshoring (Braeutigam, 2009). Carmel and Tija (2005) said for Germany, for example, these are East European countries like Poland and Russia. These countries should have the same possibilities as offshoring countries like lower resource costs and furthermore, a bigger cultural compatibility and geographical nearness. A further advantage is the same or an adequate time zone. To the EU the non-member states like Ukraine and Russia are playing an increasingly more important role. In the individual sectors (e.g., software development) which suffer at times from acute lack of personnel nearshore sourcing is also used to cover the personnel needs of the German or European market (Koehler, 2009). Nearshoring can be used in form of outsourcing or insourcing (Bitkom, 2008).
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**Offshore sourcing/ Offshoring**

The concept offshoreing also called offshore or foreign sourcing defines a form of outsourcing enterprise functions and processes abroad (Raubenheimer, 2010). Carmel and Tija (2005) argued that the concept led in Europe to particular problems from job transfer from Central Europe to India or China. Reasons for an offshoring decision are as a rule the more favourable basic conditions abroad, in particular the lower wage costs. Furthermore, the decision for offshoring is mainly based on a certain legal situation or politics of a state which favours the companies own plans (Raubenheimer, 2010). The concept offshoring can be defined in demarcation to the concepts outsourcing, nearshore sourcing and onshore sourcing as different although the frontiers are not clear (Boes and Schwemmle, 2005).

**Global sourcing**

The literature contains no clear definition of the term “global sourcing”. Recently, the company EDS coined the term “best shore” which means the company outsources to countries with the best conditions (Koehler, 2007). The global sourcing strategy was supported by large companies’ globalisation plans. For example, India has the best conditions for Europe and the USA because the cheap IT specialists there speak English.

**Number of vendors**

The number of vendors is classified in single sourcing, double sourcing and multi sourcing. Single sourcing means that the company has only one vendor. In contrast to this double sourcing where the company uses a second one as a backup. In praxis this concept does not work because it is difficult to coordinate the vendors to have a 100% backup (Koehler, 2007). A further problem is the costs for this solution but also the quality of the vendors services raise because they are constantly in competition against each other (Raubenheimer, 2010). The use of several different vendors is called multi sourcing.
Financial dependence

Koehler (2007) defined that the financial dependence is separated into internal/ captive outsourcing, external outsourcing and joint venture. This aspect is often not considered in literature but the juridical and economical relationship between the customer and the vendor is very important. Internal or captive outsourcing means the special case that the services for a company location are provided from the company’s internal market place (Koehler, 2007). Internally the location pays the headquarters for this service.

Dibbern and Heinze (2001) defined this also as intercompany outsourcing although this type is also not really outsourcing because the company builds up in the most cases an internal IT service provider to concentrate on IT stuff, responsibilities and know-how. Braeutigam et al. (2009) stated that this internal service provider also hosts the datacentre and does all tasks in the information technology which are necessary for the company. All other outsourcing activities are in theory external costs for the customers. Here service level agreements and contracts from two to ten years give the basic conditions for this deal. A special form here is also the joint venture where the customer and the vendors have their own company together (Braeutigam et al., 2009).

Strategic aspects

From the strategic view outsourcing can be separated into the five classes co-sourcing, transitional outsourcing, transformational outsourcing and value-added outsourcing.

Co-sourcing

The term co-sourcing was founded by an IT vendor and means that the vendor’s costs are calculated not per IT unit but are business process oriented or are dependent on the customer’s economic success. In this context it is also possible that the customer places his own staff in key positions in the vendor’s organisation (Lacity and Willcocks, 2001; Koehler, 2007).
Transitional outsourcing/ next generation outsourcing

The Bitkom (2008) defined that the transitional outsourcing also called next generation outsourcing is the economic relationship between the parallel production of a current and a new infrastructure, which is built up by a service provider. Furthermore, it means that a service provider also migrate applications or data on new technical platforms for the customer (Braeutigam et al, 2009). A good example is the Telekom migrating NRW police’s main application IGVP to the new main application VIWA. The service provider programmed the new application and migrated the old data into the new parallel system (NRW police, 2015).

Business transformation outsourcing / transformational outsourcing

Koehler (2007) defined that business transformation outsourcing (BTO – also known as transformational outsourcing) as where the service provider takes over business-critical parts of the customer’s organisation and optimises the processes in accordance with the company’s strategy. After this optimisation the tasks and processes are reintegrated into the customer infrastructure. In contrast to classical business consulting the focus is on process optimisations (Koehler, 2007). A good example is SAP employees migrating an old accounting system into a new SAP system, redesigning the whole processes internally and then returning the optimised and more competitive version to the customer.

Level of business orientation

The diagram of Jouanne-Diedrich (2006) subdivided the level of business orientation into the four dimensions infrastructure outsourcing, application outsourcing, business process outsourcing and knowledge process outsourcing.
Infrastructure outsourcing

Koehler (2007) described infrastructure outsourcing as the outsourcing of a company’s IT infrastructure and network related services to a service provider. Depending on the vendor and the supply limits under this label presented services also on single aspects like desktop outsourcing or wide area network (WAN) outsourcing. The service provider Accenture (2010) called the maintenance and management of the customer’s IT infrastructure information technology outsourcing (ITO). In literature the term “communication sourcing” also called “communication outsourcing” is related to the infrastructure outsourcing. This outsourcing form which also contains network relative services like web hosting and email for example has developed many times during the last years. There are strong differences in the concrete realisation of the relationship between the customer and the outsourcing partner (Braeutigam et al., 2009). Koehler (2007) developed a communication-resourcing model in his book “network consolidation” in which he connects the delicate separation of the service components with the innovative and customer friendly port and service based billing system and integrated them in a one system. The outsourcing areas from application service providing and ITO are melting together.

Application outsourcing

In literature there is no clear position if application service providing (ASP) is outsourcing. Braeutigam et al. (2009) stated that sometimes ASP and outsourcing are defined as two separate solutions with different aims, although others see it as an evolutional development of outsourcing and also belong to selective outsourcing. The main difference between both is that the provider offers the customer an individual customised portfolio. But the main aim of asp is the one-to-many strategy to provide standard solutions to many different customers (Braeutigam et al., 2009). Kohler (2007) defined that application service providing as providing an application over the internet from the vendor’s datacentre. Dittrich and Braun (2004) defined as special form of application service providing where the internal vendor provides company applications (MS Office, e-mail etc.) to all other enterprises locations.
**Business process outsourcing**

Kohler (2007) defined that business process outsourcing as outsourcing of an entire enterprise process to a service provider. For example, an enterprise process gives the maintenance of the data in a database to India because of the more favourable conditions in this country. In most cases only processes are outsourced which are not too complicated and for which no highly educated specialists are needed (Kohler, 2007). This is in contrast to knowledge process outsourcing, which is only used for processes that are more complicated. Dittrich and Braun (2004) wrote in that business process outsourcing, business process services, business transformation outsourcing and business transformational outsourcing are synonymous but this is in contrast to the definition of authors quoted in the chapter BTO.

**Knowledge process outsourcing**

A special form of partial outsourcing is the knowledge process outsourcing (KPO) because the primary aim is mostly not cost saving, but possibly the compensation of none existing knowledge or more the lack of critical mass in the enterprise (Bitkom, 2008). If an enterprise introduces, e.g., an IT application, this is often the occasion to outsource to a third enterprise and not to build up special knowledge (Carmel and Tija, 2005). In most cases the time is too short to achieve this new knowledge or it is too expensive to hire new specialists because at the end of the pilot project period these specialists are no longer needed in large numbers (Koehler, 2007). He further argued that service providers which provide KPO services have highly skilled specialists with a deep knowledge in particular areas of IT. This is also the main difference between KPO and BPO.

**Level of outsourcing**

The level of outsourcing can be grouped into three categories total outsourcing, selective outsourcing and total insourcing.
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**Full insourcing/ out-tasking**
In literature Jouanne-Diedrich (2006) the term full insourcing is defined as the case if from 0 to less than 20% are outsourced to service provider. The company does most of the IT work with their own staff. The terms total, full and complete insourcing are used synonymously in literature. Willcocks and Lacity came to these findings in 2001, so I suppose that Jouanne-Diedrich (2006) adapted it from them.

**Selective outsourcing**
Special kinds of outsourcing are distinguished and the definitions considerably vary thus out-tasking, partial outsourcing and selective/ smart outsourcing are often synonymous. The terminology in the literature regarding this term is relatively unclear although in the past it was the most common outsourcing form in IT. Jouanne Diedrich (2006) defined that if from 20 to 80% are outsourced it is called selective outsourcing. It can be defined as external service providers taking over single duties or special parts of a process or area will transfer to a third enterprise (Lacity and Willcocks, 2001).

Figure 9: Selective outsourcing (Soeding, 2002)
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Braeutigam (2009) understood the assignment of a partial job or a sub range as selective outsourcing. In strict sense this is not outsourcing, because only sub ranges of the IT Company are distributed to one or several service providers. Selective outsourcing is also a concept used to describe this. The customer itself decides, especially here, in which case and which area the assignment of a job or an IT project is given to a service provider (Braeutigam et al, 2009).

*Full outsourcing*

Jouanne-Diedrich (2006) defined that if more than 80% of a company’s IT infrastructure are outsourced to a service provider it is also called total, full or complete outsourcing. An enterprise benefits from the services offered by the service provider (Lacity and Willcocks, 2001). They further argued that with a complete outsourcing considerable consultation expenditure is incurred such as management consultants, lawyers, results etc.. The costs of this expenditure might exceed the cost effectiveness for a small business. There is also the loss of control of the IT area. Braeutigam et al. (2009) stated that it is a question of where the loyalty and the responsibility of the employees of foreign enterprises lie by certain decisions. A whole enterprise area is outsourced, for example, an enterprise hands over the electronic data processing (EDP) to an IT service provider for a contract term from two to ten years. Apart from that this changes not only the assets, but also large parts of the affected staff in the third enterprise (Braeutigam et al., 2009).

2.5.2. Areas in which German companies outsource

In the graph from Accenture (2004) it is obvious that from all companies questioned most of them have their highest outsourcing activities in IT. The following explains why it has advantages to outsource in the following four main areas of the IT:

- network infrastructure, desktop services
- helpdesk, user support
- datacentre capacity, data processing
- software hosting, application
Software Hosting, application development

In figure 10 is clearly evident that in the area of software hosting 41% of the German enterprises questioned outsource the application development (Accenture, 2004). The special know-how for the development of certain applications is protracted and resource-intensive. As a rule the personnel expenditure is not worthwhile for proprietary developments, hence, many companies use the experiences and the software products of the service providers. Through the introduction of a SAP system in a company for example high personnel resources are required at the beginning for the equipment of the system to the customer’s specific settings. After the implementation of the SAP system it is inevitably no longer necessary to keep many SAP specialists (Braeutigam et al., 2009).

Data processing, datacentre capacity

38% of these enterprises outsource the data processing to foreign datacentres (Accenture, 2004). The security standards of a stable computer centre are not to be financeable for smaller small and medium-sized companies. Here the huge number of backup systems which are administered by the respective specialists for single systems must be extended and maintained. The costs for secured server rooms air-conditioning, alarm systems and supervision are immense. (Braeutigam et al, 2009)

Helpdesk, User-Support

The triumphal procession which the big system houses made during the last years confirms that 37% of the questioned companies outsourced their helpdesk and user support to a service provider (Accenture, 2004).
Braeutigam et al. (2009) argued that this only works because the costs for a service provider lie on the one hand under those of a company’s own staff and on the other hand it does not pay for a company to hold specialists for the huge number of the constantly changing software products. He further defined that as a rule the employees of a service provider do not work for the Helpdesk area at normal rates of pay. This cost level cannot be realised in large and medium sized companies on the basis of wage agreements and union rates. The service provider’s employees work beside the customers IT personnel in the company all the time. They are a kind of second class employee in the company (Braeutigam et al, 2009).
Network infrastructure, desktop service

In the Accenture survey (2004) 35% of the German companies questioned lease their PCs. As a rule a PC is leased for three to four years. During this period the machines are exchanged or repaired on site in the case of disturbances. The machines are delivered with the desired uniform software image which makes later administration easier. Also the uniform hardware continuance simplifies the servicing. Apart from that, the leasing partner receives better purchase conditions which he can pass on directly to the customer. A typical desktop with monitor and several years’ service contract costs between 750 – 1200.- Euros. These are price conditions for a Fujitsu PC with support contract as of July, 2009 for a wholesale customer (Police project group, 2009). Because of the good conditions for the hardware which large companies receive, the purchase price of the PCs is cheaper. The companies also save on staff that has to look after the servicing and repair of the hardware. Also because the PCs were already completely installed by the service provider personnel can be saved (Braeutigam et al., 2009).

2.5.3. Outsourcing activities in large German companies

The survey from 2007 of the German consulting firm Luenendonk among 32 large German companies showed that nearly all of them use external IT services. 94% of them have Freelancers and other external IT consultants for the software development. 87% of the companies have contracts with consulting companies and IT vendors. Almost 70% of the questioned companies have contracts and service level agreements with external vendors in the area of maintenance and development of software and hardware. In 54% of the cases the IT vendors overtake parts of the customers IT staff and infrastructure. Up to the year 2010 12% of the questioned firms which have not outsourced said that they are planning outsourcing. Furthermore 13% of the companies which also have not outsourced said they are ready to sign outsourcing contracts with their favoured vendors.
In the graphic below 42% of the 32 companies want to build the outsourcing of the IT infrastructure maintenance. On the second position of the planned outsourcing activities are the user helpdesk and the desktop management with 38% because these two areas belong to lower IT services which can be done by cheap and low qualified IT staff.

![Graph showing planned IT outsourcing activities in 32 large German companies (Luenendonk, 2007)](image)

The companies also planned in 31% of all cases to source out more of the server hosting due to the high costs of datacentres. The companies planned the business process outsourcing to countries with lower wage levels in 33% of all cases. According to Luenendonk Consulting (2007) it is typical for large companies to focus on a few strong preferred partners because they work sometimes together with over 100 different IT vendors.
The reputation, the level of awareness, the market position and size of the IT vendor is not important for the choice. Today already 87% of the 32 companies already use offshore resource from low wage countries and the rest of them are planning to do this. The German mid-sized companies have only less near and off shore experience and with their smaller IT infrastructure there not able to use the same costs advantages like the large companies (Luenendonk, 2007).

2.5.4. Reasons for outsourcing

Reasons for outsourcing from the point of view of the management

(Dibbern and Heinzl, 2001; Raubenheimer, 2010)
- Concentration on core competences
- Divert resources of the core business (turning away from diversification strategies; reduction vertical / horizontal integration)
- Outsourcing of capacities
- Specialists can concentrate on the duties relevant for the enterprise
- Increase of quality and speed concerning the IT infrastructure and IT services used
- Increase of flexibility (e.g., concerning capacity planning)
- Clear planning

Costs as a reason for outsourcing

(Koehler, 2007; Braeutigam et al., 2009)
- Cost reduction by exhaustion of dimensions advantages and wide advantages of the outsourcing supplier
- Change to fixed costs from variable costs
- Improvement in the calculation of costs and cost transparency
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Technology / risks as a reason for outsourcing
(Meier, A. et al., 2008; Raupenheimer, 2010)
- Access to special know-how (technology and staff)
- Improving innovation strength / increase in the innovation potential
- Possibilities of the use of modern technologies without own investments
- Flexibility with regard to capacity adaptations / changes
- Reduction / misalignment of risks
- With regard to the technology development
- With regard to the increasing complexity of the application of modern IT
- By contract regulated shifting of risks and possible dangers at the outsourcing supplier
- Rise of IT security

Staff as a reason for Outsourcing
(Braeutigam et al., 2009; Bullinger et al., 2007)
- Reduction of the dependence on individual employees with special know-how
- Reduction of the number of staff in the IT area
- Defusing personnel procurement problems in the area
- Discharge of the internal IT routine work (use traffic jam avoidance)
- Prevention of risks with regard to a future shortage of certified IT forces
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2.5.5. Outsourcing complexity

With outsourcing projects there are different demands depending on the differences of the customer's organisation and arrangement of the outsourcing. Apart from that, the demands of a complete or partial outsourcing are bigger within the enterprises and for the employees involved in it, than with the nevertheless very simple concentration of the IT activities in a normal enterprise (Braeutigam et al., 2009).

Figure 12: Most important reasons for outsourcing (Accenture IMC, 2004)
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Figure 13: Demands of Outsourcing on customer and supplier (Dibbern and Heinzl, 2001)

2.5.6. IT outsourcing market volume

The IT outsourcing market has in Germany a volume of about 8-10 billion € (non-captive, for example by service providers not accompanying a group). From 2002 to 2008 the average market growth (CAGR) amounts to about 10-12%. So application management rises on an average of about 30%, business process outsourcing even about 35-38 per cent. According to analyst's the market is estimated to be more than 1 billion € for BPO in 2008. This all belongs to a part of the globalisation of enterprise structures (Carmel and Tija, 2005).

These values are similar to the study of Deutsche Bank Research because here the market volume of IT outsourcing in Germany in the year 2003 was 10 Billion Euro with a constantly yearly growth of ten per cent. In the whole of Europe, the growth could be 17% per year. IT offshoring is only a small part of all outsourcing activities in Germany because most of them are sourced out to the big vendors like T-Systems, IBM or SBS which are inside the country (Jouanne-Diedrich, 2006). According to the study of A.T. Kearny (2004), 90% of all American and 45% of all European companies prefer Indian vendors for their offshoring projects. In the long term, China and Eastern Europe especially Poland and Russia will reach the same position as India.
2.5.7. Resource-based view

On the one hand the concept of the core competences from the resource based view of a company and on the other hand the transaction cost concept is used. Independent from company specific aims for outsourcing there is clarity about the topic that core competences should stay in a company and none core competences could be outsourced. So it necessary for a company to differentiate their IT portfolio with a transparent and understandable methodology in core and none core competences. Barney (1991) defined the following four indicators:

Valuable: Resources and abilities which helps a company to neutralise risks and helps to use chances in the market.

Difficult to imitate: Resources and abilities which other companies cannot imitate.

None substitute: Resources and abilities which have no strategic equivalent, for example company specific knowledge or thrust relationships (Dibbern und Heinze, 2001).

In the examination of none core competences for outsourcing the transaction costs theory should be used because these will emerge. Picot and Dietl (1990) separate in these costs into the following four categories:

Preparation costs: Costs which occur by the choice of the deliver for example for market research, tender choice of outsourcing partner.

Agreement costs: Costs which come up in the phase of contract conference with the outsourcing partner.

Management costs: Costs which emerge by the management of the outsourcing partner, for example for service level or finance management.

Adaptation costs: Cost which are necessary through changes in the outsourcing relationships, for example change of interfaces of remaining processes or systems.

Transaction costs rise with the complexity of services which are outsourced and should be part of every calculation of profitability (Dibbern and Heinze, 2001).

In my research I will not the transaction cost theory because it does not fit in my research model. The detailed explanation for this is in section 2.6.3.
2.6. Core IT capabilities and sourcing strategy in IT

The research question was to find out whether the IT governance and IT outsourcing strategies of large private companies would be practical for the NRW police. IT governance is a part of wider governance and IT outsourcing is a strategy within IT governance. Previous chapters have described how governance in private companies and in the public service works. The next logical step to underpin the research question is to define IT governance on the basis of the COBIT IT governance framework. The previous chapters provided background information about IT outsourcing which helped to identify the reasons behind companies’ IT outsourcing strategies. All the preceding information was necessary to understand the nine core IT capabilities framework from Lacity and Willcocks (2001) to exploit IT as a strategic resource. Both authors used this framework in their case studies within the IT industry, as it is also the popularly accepted in this field. Therefore, it was sensible to combine the COBIT IT governance framework with the nine core IT capabilities framework for my further research. This connected corporate governance, governance in the public administration, IT governance, IT outsourcing and the core IT capabilities.

2.6.1. Sourcing IT/ IS: The core-periphery model revisited

Lacity and Willcocks (2001) stated that many organisations have, to a certain degree, in the past somehow used external markets to outsource the IT, whether in the form of technology, services or human resources. They further argued that in the 1990s, the view on in-house IT function changed to have a strategic, residual, governance or customer role. This definition presupposes a complete in-house involvement in upstream activities such as information management (IM) and the development of information systems (IS) strategies to meet business needs (Lacity and Willocks, 2001). It also takes for granted a procurement and management role related to downstream activities such as systems development support and operational services. This definition also promotes the perspective of how major or even total outsourced IT should be supported with an in-house IT function that is based on the nine core capabilities (Lacity and Willocks, 2001).
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Figure 14: Core IT capabilities and sourcing strategy in IT (Lacity and Willcocks, 2001)

Lacity and Willcocks (2001) defined that IM, IS and IT all possess a necessity to create, operate, enable and improve with at least some level of activity in each phase of the process all of the time. They further argued that the demand-supply and the strategy enactment have to be the basis on which sourcing decisions are made. Nevertheless, this raises the question of how do resource-based concepts of core capabilities/-distinctive competencies ally to this model of IT activities under the circumstances of developing external IT service markets? The business owns the IM strategy for outsourcing the IT. A supplier who is a strategic partner responsible for creating and implementing IS and IT strategies and implementing IM, occupies the rest of the work (Lacity and Willcocks, 2001).
However, no organisation is able to stay informed about its demand-side needs and in control of its IT investment with a supplier without a more detailed definition of the core capabilities in IT function and in-house specialists (Lacity and Willcocks, 2001). They revealed nine key capabilities based on sustainable survival and competitive success that have to be developed in order to enable an organisation to receive, expand and influence IT investments over time. Obviously, a lot relies on the quality of such capabilities and the amount on which they are supported by the wider organisation. The basis for a lasting competitive advantage through IT is described as an interaction among the generic lead-time, competitive asymmetry and preemption potential (Lacity and Willcocks, 2001).

Projects, organisations and business decisions that only rely on the aspect of generic lead-time are at risk. Competitive asymmetry can be developed with the help of core IT capabilities, which provide both the organisational and knowledge sources. In addition, core IT capabilities provide the capability to both identify the prime moves that can be made and secure that preemption is not imitable (Lacity and Willcocks, 2001).

Lacity and Willocks (2001) found three points during their studies. First, competitive edge systems are mostly only able to develop in an incremental way over time and outside of planning systems. Second, in order to get the IT investments off the ground you need processes, power and relationships as a source. Third, most organisations and IT departments are mainly based on hierarchical and functional lines. They further argued that the high performance model of the core IT capabilities is able to match the requirements and solve the problems of the first two cases. In detail this means that in order to achieve a solution the relationship, the roles and how they are fulfilled bridge existing gaps in the former organisational arrangements.

They further stated that this facilitates the flow of information and ideas and the creation of support mechanisms for leveraging IT investments. In addition to that business thinking systems that are the basis of organisational and IT based systems represent a significant development for the capability of improving business based systems. The model of the emergent IT function, which also offers vital ways of reconfiguring some major barriers to leveraging IT effectively, serves as a solution for the third problem (Lacity and Willcocks, 2001).
Both authors argued that core IT capabilities have a huge impact on the IT market sourcing strategy and its relationship to organisational performance. A more detailed description of the sourcing options is required to show how optimal decisions can be reached and delivered. With the help of this it is also possible to meet some points of the challenges of human resources. Even if it is frequently presented in that way, IT sourcing decisions do not have to be binary choices. It does not matter in this case whether the IT is outsourced in-house or to an external provider. A key distinction can be made with a more complex model. When IT is outsourced, contracts are needed that specify the service and the results that will be provided. Regarding IT insourcing, contracts have to be made that call for the market to provide resources to be deployed under the buyer’s management and control. A more complex model even differentiates the purchasing style. A consistently open tender means in this case that there is competition for each market transaction. When certain provisions are met with a single tender and a preferred supplier it is a relationship oriented purchasing style (Lacity and Willcocks, 2001). Lacity and Willcocks (2001) said that analysis has shown that there are five sourcing options. Three of them are insourcing options. They include a relationship oriented purchasing style and in-house IT specialists. The other two sourcing options are outsourced. They contract out with outsourced IT specialists, but also have a relationship orientated purchasing style. In practice these options are a two sided medal because on the one hand they offer more opportunities to gain leverage from internal and external IT services and on the other hand they possess more potential risks and difficulties. The high performance model provides and enforces the in-house capability to make choices regarding the complex arena. Insourcing options can also be used to meet some of the human resource challenges presented by the high performance model (Lacity and Willcocks, 2001). Lacity and Willcocks (2001) also said that the specified working roles of the CIO, informed buyer, business systems thinker, relationship builder and contract facilitator are the priorities of in-house resourcing. They provide the best opportunity for ongoing business orientation, but the other four roles of technical architect, technical fixer, contract monitor and vendor developer lie in the working space of an outsourced organisation.
They further argued that if those roles are insourced to a preferred supplier, they possibly accommodate a check and balance on the contractors to whom service provisions have been outsourced. Furthermore, it would be important to an insourced organisation to build up that capability as a form of succession planning. All in all one can say that it is better to insource on the basis of the nine core capabilities than to dispossess the high performance IT function of some of its facilities (Lacity and Willcocks, 2001).

2.6.2. Nine Core IT Capabilities

Business and IT vision, design of IT architecture and delivery of IS services are three enduring challenges of IT exploitation, which determine and detect by reference the following nine core IS capabilities (Willcocks et al., 2007, 2014, 2015; Lacity and Willcocks, 2001, 2009, 2014).

**Figure 15:** Moving from Resources to Capabilities to Competencies (Willcocks et al., 2014)
Figure 15 shows the relationship between resources, capabilities and competencies. Willcocks et al. (2014) defined that an organisation must have resources and by adding human capabilities, resources are transformed into organisational competencies. They stated that a role refers to an individual person enacting capabilities. In addition, they claimed that a resource consists of both human and physical assets such as tools, workforce, technologies and physical facilities. Capabilities transform resources into specific business activities. Capabilities comprise human based orientations, motivations, behaviours and skills. In general, capabilities are the basis of competencies that improve business performance.

Client competencies
Willcocks et al. (2014) described that the following four client competencies are necessary for business success.

The first client competence is governance including coordination and leadership involved in the alignment of the function activities with the organisation as a whole. The demand-driven competence of creating the visions of the business and functions defines business requirements and shows how the capabilities and systems can be optimised for the entire business. Willcocks et al. (2014) further stated that the supply-focused competences define processes, information and systems (architecture planning and design). This support deals with the risks inherent in non-routine issues and business requirements. Finally, the delivery of services is a competence that assists management in sourcing strategies, especially the management of internal and external services and resources over time.
Capability 1 – IT governance/leadership

Willcocks et al. (2014) defined that the intent of effective IT leadership is to integrate IT effort with business purpose and activity. In order to achieve this leaders devise organisational arrangements to address each challenge area, they set goals and direction and they manage the interdependencies among them. IT leadership also influences the overall business perception of the role and contribution of IT. The leadership achieves this by creating a shared vision and establishing appropriate values and culture within the IS function. While the CIO traditionally has the role of leadership, it has become increasingly fashionable to question this allocation for the future (Willcocks et al, 2014; Lacity and Willcocks, 2001).
Capability 2 – business systems thinking (process management)

Willcocks et al. (2014) defined that experts in business systems thinking envision the business process which technology makes possible. Business systems thinking is necessary for meeting the challenges of business and IT vision. It counteracts the lack of progress the integration of business development with IT capability. This lack of progress is seen in IT investments as not supporting ageing and inefficient processes and also in the additions to new processes that have been designed without current IT capability in mind. In order to create a suitable business systems thinking plan insight in the planning of the IT architecture of an organisation is needed. It also shows the need for informed buying (Willcocks et al., 2014; Lacity and Willcocks, 2001).

Capability 3 – relationship building (communication)

Willcocks et al. (2014) defined that relationship building gets the business constructively engaged in IT issues. Regarding the context of delivery of IS services relationship building has the role of reducing the gap between the IT specialists and the users, helping them work together. Therefore, the most important contribution of relationship building, as related to IT, is the creation of mutual confidence, harmony of purpose and successful communication between those focused on business and those focused on technical agendas. The development of a higher valued agenda in the exploitation of IT and business thinking activity is successful relationship building (Willcocks et al., 2014; Lacity and Willcocks, 2001).

Capability 4 – architecture planning

Willcocks et al. (2016) stated that the purpose of architecture planning is to create the theoretical basis for a technical platform that responds to present and future business needs.
The in-house expertise can develop a suitable technical platform through insight into suppliers, technology and business directions. Without in-house expertise for architecture planning it is difficult to provide the necessary adaptability and integration. On the other hand outsourced expertise in this area will place less priority on shaping the IT infrastructure – unless it results in higher profits. Obviously in-house architecture planning results in a position of strength when it comes to IT infrastructure (Willcocks et al., 2014; Lacity and Willcocks, 2001).

**Capability 5 – making technology work**

Willcocks et al. (2016) defined that this capability targets the achievement of rapid technical progress with the help of in-house IT-specialists. In order to make that possible it requires a lot of insight based in the role of architecture planning in addition to an efficient and short-term orientation. This is not given if the IT is completely outsourced.

At this time there are two deciding contributions that in-house IT specialists generate in the area of making technology work. First of all, they rapidly correct problems that are disclaimed by others across the chain of action. Secondly, they are able to identify how to address business needs that cannot be sufficiently contended by standard technical approaches (Willcocks et al., 2014; Lacity and Willcocks, 2001).

**Capability 6 – informed buying**

Willcocks et al. (2014) stated that the informed buyer has after the CIO the most important role regarding IT in an organisation that is completely outsourced. The work of the informed buyer takes into account three challenging areas. First, it includes analysis of the external market for IS/IT services. Second, it includes selecting of a sourcing strategy to meet business needs and technology issues. Third, it is the role of leadership when it comes to tendering, contracting and service management processes. With time, two trends in evidence have been worked out.
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Firstly, business management now wants reassurance that the in-house option is doubtlessly apt and competitive compared to the external option. (Willcocks et al., 2014; Lacity and Willcocks, 2001). Secondly, while datacentres and other operational units are concentrated to target efficiencies, in-house services are provided on the basis of more explicit, quasi contractual agreements. The role of the informed buyer is to secure the service agreements for IT delivery by commanding the assurance of the business and those responsible for IT architecture (Willcocks et al., 2014; Lacity and Willcocks, 2001).

**Capability 7 – contract facilitation**

Willcocks et al. (2014) said that contract facilitation operates in the areas of supply services or products and core business. In large organisations in a long-term relationship it is important to resolve problems and conflicts promptly. Large organisations have a lot of service providers and suppliers. Therefore, strict roles and good coordination are necessary to manage user demands and avoid cost overruns with the suppliers and service providers. It is necessary to have contracts and service level agreements for internal IT services (Willcocks et al., 2014; Lacity and Willcocks, 2001).

**Capability 8 – contract monitoring**

The contract monitor ensures in contrast to the contract facilitator the business’ current contracts as well those for the future. Willcocks et al. (2014) say that contract monitoring is a core IT capability for protecting the business position. Contract monitoring forces the supplier to meet the service level agreements and develops performance standards for the service market. Organisations can develop a report card to benchmark each provider’s achievements and compare them with the standards in the service contract. This capability fits the contract facilitation capability. Furthermore, this capability belongs to the COBIT focus area of resource management and performance management.
The internal IT control system monitors the fulfilment of service levels, aims and goals. It benchmarks the service providers and suppliers and measures the IT efficiency and IT profitability (Willcocks et al., 2014; Lacity and Willcocks, 2001).

**Capability 9 – vendor development**

Willcocks et al. (2014) defined vendor development as identifying the potential added value of IT suppliers and providers. The main aim of IT outsourcing is to minimise costs. Companies should use vendor development to look beyond existing service contracts and discover long-term supplier potential. The supplier increases his profits by providing services and the customer improves his core business benefits. The contract must be a win-win situation for both customer and supplier (Willcocks et al., 2014; Lacity and Willcocks, 2001).

**Soft skills**

Lacity and Willcocks (2001) stated that for the modern IT function the greater external face is important as shown in the requirement of interpersonal skills in seven of nine core capabilities. With the growing dependence on the provision of external IT there is a greater contact with business users and managers. This creates critical teamwork in the group. The variation in the types of interpersonal skills across the different roles constitutes a solution for this problem. The CIO role competences including leadership skills, as well as the abilities of an informed buyer and to a lesser extent the systems thinker role is needed. This means a CIO requires skills in communication, team-building and facilitation. These skills are used in the definition of the roles of the relationship-builder, contract facilitator and the informed buyer. Furthermore, another prime necessity for the named roles is negotiation skills (Lacity and Willcocks, 2001).
Project management

Lacity and Willcocks (2001) said that in dynamic business environments there has been a shift of emphasis from hierarchical, functionally based organisations to task and project-based operations. This means that project management skills will spread throughout task and project-based operating organisations. In relation to IT, it does not matter what the IT component in a project is. They further argued that the project manager can come from any business field. The most important benchmark is credibility, which reflects proven success when it comes to managing projects. Candidates for the role of project manager are most likely found in the fields of relationship-building and technical fixing. This depends on how user driven the project sets out to be. Another two roles that come up in connection with project work are the project sponsor and the project champion. These roles, depending on the importance and the technical content of the project should normally be held by senior business managers such the CIO (Lacity and Willcocks, 2001).
### Table 5: Capabilities and skills in the emerging IT function (Lacity and Willcocks, 2001)

<table>
<thead>
<tr>
<th>Capability</th>
<th>Exhibited behaviours in role</th>
<th>Skills</th>
<th>Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. IS/IT Governance</strong></td>
<td><em>Establishes and maintains executive relationships</em></td>
<td></td>
<td><em>Adding value to the business</em></td>
</tr>
<tr>
<td></td>
<td><em>Strives to achieve shared and challenging vision of role of IT in the business</em></td>
<td></td>
<td><em>High concern for acceptance and exploitation</em></td>
</tr>
<tr>
<td></td>
<td><em>Develops the culture and orientation of IT/IS function</em></td>
<td></td>
<td><em>Continuous business and personal development</em></td>
</tr>
<tr>
<td></td>
<td><em>Searches for and promotes best practice in information management</em></td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td><strong>2. Business Systems Thinking</strong></td>
<td><em>Contributes to development of business strategy and operation</em></td>
<td></td>
<td><em>Adding value to business</em></td>
</tr>
<tr>
<td></td>
<td><em>Identifies/communicates current patterns of organization and activity</em></td>
<td></td>
<td><em>Holistic understanding</em></td>
</tr>
<tr>
<td></td>
<td><em>Envisions potential new patterns</em></td>
<td></td>
<td><em>Innovation/creativity</em></td>
</tr>
<tr>
<td></td>
<td><em>Identifies connection and interdependencies</em></td>
<td>Low/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td><strong>3. Business-IT Relationship Building</strong></td>
<td><em>Develops user understanding of potential IT</em></td>
<td></td>
<td><em>Adding value to the business</em></td>
</tr>
<tr>
<td></td>
<td><em>Helps users and IT specialists to communicate and work together</em></td>
<td></td>
<td><em>Curiosity about individual personalities and motivations</em></td>
</tr>
<tr>
<td></td>
<td><em>Ensures user ownership and satisfaction</em></td>
<td>Medium/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td><strong>4. Designing Technical Architecture</strong></td>
<td><em>Analyses Trends in development of a range of technologies</em></td>
<td>High</td>
<td><em>Fascinated by new technologies</em></td>
</tr>
<tr>
<td></td>
<td><em>Develops vision of integrated technical platform</em></td>
<td>Low/</td>
<td><em>Holistic thinking and design</em></td>
</tr>
<tr>
<td></td>
<td><em>Formulates policies to ensure necessary integration and flexibility of IT services</em></td>
<td>Medium</td>
<td><em>Acceptance as technology thought leader</em></td>
</tr>
<tr>
<td><strong>5. Making Technology work</strong></td>
<td><em>Focused on action and problem-solving</em></td>
<td></td>
<td><em>Hobby as work</em></td>
</tr>
<tr>
<td></td>
<td><em>Understands internal design of IT systems</em></td>
<td></td>
<td><em>Getting the right result</em></td>
</tr>
<tr>
<td></td>
<td><em>Delivers very high programming productivity</em></td>
<td>High</td>
<td><em>Recognition for professional prowess</em></td>
</tr>
<tr>
<td></td>
<td><em>Comfortable with wide ranges of technical regimes</em></td>
<td>Low</td>
<td><em>Freedom to perform</em></td>
</tr>
<tr>
<td><strong>6. Informed Buying of IT Service</strong></td>
<td><em>Monitors available services of external suppliers</em></td>
<td></td>
<td><em>Understanding bargaining structures</em></td>
</tr>
<tr>
<td></td>
<td><em>Analyses nature of service requirements for immediate and longer term</em></td>
<td></td>
<td><em>Involvement in negotiating</em></td>
</tr>
<tr>
<td></td>
<td><em>Structures tendering process</em></td>
<td>Medium</td>
<td><em>Achieving hard but fair results</em></td>
</tr>
<tr>
<td></td>
<td><em>Overseas contract negotiations</em></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td><strong>7. Contract Facilitation</strong></td>
<td><em>Facilitate/manage people relationships</em></td>
<td></td>
<td><em>Achieving day-to-day progress</em></td>
</tr>
<tr>
<td></td>
<td><em>Devises/pursue processes for conflict resolution</em></td>
<td>Medium</td>
<td><em>Building and sustaining partnerships</em></td>
</tr>
<tr>
<td></td>
<td><em>Interpret business and technical issues within established contract framework</em></td>
<td>Medium</td>
<td><em>Protecting business interests</em></td>
</tr>
<tr>
<td><strong>8. Contract Monitoring</strong></td>
<td><em>Monitoring results against goals</em></td>
<td></td>
<td><em>Delight in detail</em></td>
</tr>
<tr>
<td></td>
<td><em>Benchmarking existing contracts against developing market capability</em></td>
<td>Medium</td>
<td><em>Focus on hard measures</em></td>
</tr>
<tr>
<td></td>
<td><em>Negotiating detailed amendments</em></td>
<td>Medium</td>
<td><em>Professional standards and networking</em></td>
</tr>
<tr>
<td></td>
<td><em>Identifying/protecting against potential precedents</em></td>
<td>Low/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td><strong>9. Vendor Development</strong></td>
<td><em>Analyses emerging structure of services market</em></td>
<td></td>
<td><em>Innovation</em></td>
</tr>
<tr>
<td></td>
<td><em>Asses specific vendors – goals and capabilities</em></td>
<td>Medium</td>
<td><em>Potential from partnership</em></td>
</tr>
<tr>
<td></td>
<td><em>Explores potential for new vendor services</em></td>
<td>High</td>
<td><em>Industry analysis orientation</em></td>
</tr>
<tr>
<td></td>
<td><em>Identifies opportunities for added value to business and vendor</em></td>
<td>Medium</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
2.6.3. Why I used Lacity and Willcocks’ nine core IT capabilities framework?

Willcocks is the co-author of 45 books and has published over 230 refereed papers in journals. He is director of the Outsourcing Unit at the Department of Management at the London School of Economics. However, Willcocks has worldwide a high research reputation after 20 years of outsourcing research. Lacity and Willcocks applied their nine core IT capabilities framework in several articles and books in 2001, 2006, 2007, 2012, 2014 and 2015. After 17 years, it is not an outdated theory, it is still used and cited by many researchers worldwide. Researchgate (2018) noted that Willcocks et al.’s article about their IT framework has been cited over 600 times by other authors. For example, Mitteregger (2009), Wang et al. (2012), Kasraian, L. et al. (2016) and Jordan and Pham (2006) used Lacity and Willcocks’ (2001) framework in their studies. Later in 2014, the authors developed an IT framework with 12 key provider capabilities closing a gap in their theory.

However, there is now a capability framework model that has nine core IT capabilities for customers and 12 key capabilities framework for providers. In my research, I found that an organisation’s internal IT service provider act as a customer for the external providers and as an internal provider for the organisation. In this case, the organisation also needs provider capabilities such as project management and staff management.

Willcocks et al. (2001) identified two phenomena the perception of IT as cost burden and the refocus on core IT competencies. Based on their research, they claimed that it is false to reduce IT outsourcing to simply make-or-buy decisions. An IT environment is a complex system with countless of components, a variety of hardware and software, complicated processes and IT staff that cannot be easily outsourced, unlike other parts of an organisation. Willcocks et al. (2001) found that IT is distinctive from other parts of an organisation and cannot be handled with a transaction cost approach. The nine core IT capabilities framework based on selective outsourcing has a high success rate in research based on case studies. When an organisation identifies and develops the core IT capabilities the remaining IT activities can be optimised as further potential outsourcing.
Over the decades, Willcocks has successfully performed many case studies in the IT, proving the effectiveness of his core IT capabilities framework. An internet search revealed many case studies that have used Lacity and Willcocks’ framework. I was convinced by the results and citations of Willcocks’ various publications to use his framework.

As an alternative, this study could have used transaction costs as an approach but this method requires further detailed information about the cost structure and further internal information about the researched organisation. Often, companies are not willing to reveal detailed information about financial topics. However, for my research, I needed an overview of an organisation’s IT governance and the effectiveness of its IT environment. I was convinced that this would only possible by applying Willcocks and Lacity’s framework and their resourced-based approach. Therefore, I followed Lacity and Willcocks’ (2001) opinion that IT outsourcing is more than a make-or-buy decision due to the complexity of the IT environment.

2.6.4. The 12 key provider capabilities framework

Willcocks et al. (2014) developed a framework with 12 key provider capabilities. I found out in my research that in Willocks and Lacity’s nine core capabilities framework (2001), the capabilities of project management and staff management were missing. The, new framework closes a gap in Lacity the 2001 theory model and makes a distinction between provider and client capabilities. Willcocks et al. (2014) called project management programme management and staff management behaviour (people) management but the meaning of these capabilities are identical. Therefore, I used Willcocks et al.’s (2014) key provider capabilities to support my research. The LZPD is not only the client for service providers and the suppliers, but is also the only internal service provider for all police authorities in NRW. Furthermore, I conclude that the key provider capabilities of programme management and behaviour (people) management are important for the police. In my further research I will only need to examine these two provider capabilities; therefore, it is not necessary to discuss Willcocks et al.’s (2014) key provider capabilities in detail.
Willcocks et al. (2014) research shows that a provider should develop 12 key provider capabilities to achieve the three competencies relationship competency, transformation competency and delivery competency by relating them to one another (see table below).

<table>
<thead>
<tr>
<th>Role</th>
<th>Reason the capability is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Leadership</td>
<td>To identify, coordinate and deliver overall success throughout the lifecycle.</td>
</tr>
<tr>
<td>2. Business management</td>
<td>To deliver in line with SLAs and business plans.</td>
</tr>
<tr>
<td>3. Domain expertise</td>
<td>To retain and apply professional, technical and domain knowledge.</td>
</tr>
<tr>
<td>4. Behaviour (people) management (Staff and knowledge management)</td>
<td>To motivate and inspire people to change and deliver high-level service</td>
</tr>
<tr>
<td>5. Sourcing</td>
<td>To access resources cost effectively as needed.</td>
</tr>
<tr>
<td>6. Programme management (Project management)</td>
<td>To deliver a series of inter-related projects.</td>
</tr>
<tr>
<td>7. Governance</td>
<td>To define, track and take responsibility for performance.</td>
</tr>
<tr>
<td>8. Process management</td>
<td>To identify and incorporate changes to service processes.</td>
</tr>
<tr>
<td>9. Technology exploitation</td>
<td>To swiftly and effectively deploy technology for business purposes.</td>
</tr>
<tr>
<td>10. Customer development</td>
<td>To help customers make informed decisions about KPIs, cost and functionality.</td>
</tr>
<tr>
<td>11. Planning and contracting</td>
<td>To design contracts to deliver win-win results for both parties.</td>
</tr>
<tr>
<td>12. Organisational design</td>
<td>To design and implement successful organisational arrangements.</td>
</tr>
</tbody>
</table>

Table 6: The twelve key provider capabilities (Willcocks et al., 2014)
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Figure 17: 12 key provider capabilities (Willcocks et al., 2014)
2.7. Transformation levers for business process outsourcing

Lacity and Willcocks (2014) found that many organisations do not optimise their back office due to high cost and non-existent know-how. They use non-integrated, outdated IT solutions with redundant support services and inefficient, bureaucratic and non-standardised processes. According to Lacity and Willcocks (2014), an organisation can be transformed from a messy back office to a world class IT service environment if the following five outsourcing transformation levers are used: centralisation, standardisation, optimisation, technology enablement and transfer to low-cost locations. Lacity and Willcocks (2014) found that clients often centralised their IT to internal service providers or reduced the number of IT service centres. This IT strategy leads to cost reduction, optimisation of service quality and IT processes and increases the decision-making power of the IT management. In this context, the management of IT budget and IT supply should also be centralised to increase the control and flexibility of the entire IT environment.
The researcher argued that this strategy is used by many clients as a preceding step for further outsourcing or deployment of the other transformation levers. Furthermore, Lacity and Willcocks (2014) stated that the standardisation of hardware, software and IT processes in the organisation facilitates compliance and IT processes, increases the control and scalability of the entire IT and reduces IT costs. They concluded that the standardisation in the IT also simplifies the further outsourcing of IT processes and services to service providers and suppliers.

Lacity and Willcocks (2014) argued that the optimisation procedures improve the maturity of the IT processes, save costs and increase the service quality. For example, the COBIT and ITIL frameworks provide detailed guidance and best practise methods for such optimisation processes. Lacity and Willcocks (2014) further concluded that automation and technology enablement is one of the most important levers to build highly effective IT environments. Technology enablement and automation improve the service quality, as well as increases productivity, improves compliance and control and finally reduces headcount and costs. The transformation complexity raises with the size of an organisation due to heterogeneous networks and processes, size of the IT infrastructure and fast changing market conditions.

Moreover, Lacity and Willcocks (2014) found that the relocation to a low-cost location could save costs and also raise the productivity because of the presence of highly educated specialists whose services are more affordable than those in high-cost locations. Researches have shown that work-intensive IT processes, such as programming, are cheaper in Eastern Europe, China or India. The use of service providers from these regions is also a common part of this IT strategy. I would examine if Lacity and Willcocks (2014) transformation levers (centralisation, standardisation, optimisation, technology enablement and automation and labour transfer to low-cost location) were achieved in the subject organisations.
2.8. Six major factors having impact on IT sourcing

Willcocks and Currie (1997) published an article entitled "Information Technology in public sectors: towards a contractual organisation?" in the British Journal of Management. They identified six major factors having a large impact on the following IT sourcing projects.


2. **Strategic or useful**: Strategic actions are required to achieve aims and are critical for current and future strategies. Useful activities provide incremental benefits but do not influence the competitive and strategic position.

3. **Degree of uncertainty**: This defines future aims and requirements and also includes the long-term IT strategy.

4. **Degree of technology maturity associated with IT activity/service**: This defines the maturity of IT processes and services that are influenced by new technology or dearth of IT know-how of in-house IT staff.

5. **Level of IT integration**: This defines how complex IT systems and processes are integrated into the organisations’ IT environment.

6. **In-house capability relative to that of the market**: This factor defines the classical make or buy situation in the organisation's IT sourcing strategy.

2.8.1. Case study National Health Service

Willcocks and Currie (1997) carried out two case studies in the National Health Service (NHS) and the central government. In 1991, the government initiated organisational reforms in the IT environment of the NHS. They found that in-house IT staff of the NHS is strongly skilled on batch-bureau area, telecommunication and application support but they lack skills in service level agreement, data centre management and application development.
The management, planning and implementation of new projects are already outsourced. The entire in-house IT staff of the NHS had inadequate IT know-how across all IT activities. (Willcocks and Currie, 1997).

After several failures and mixed success NHS decided to develop an internal service provider with in-house expertise, offering services to other NHS regions. The datacentre and bureau operations of the NHS were now managed by service providers, but project management and consultancy was sourced back to the NHS for better control over IT projects. The strategy was to have many service providers with short-term contracts for more flexible response to future needs and reduce dependence from a single service provider. This selective outsourcing strategy improved the availability of services, reduced costs and solved old IT problems in the NHS IT environment. The control and management of all IT and service providers of the NHS were now centralised by a highly skilled internal service provider.

Willcocks and Currie (1997) termed as “right sourcing”. In other words, the NHS found a right mix of outsourced and in-house IT activities. They found it more effective to outsource IT processes and services with a high maturity and to retain processes with a low maturity in-house for maximum control over IT. The maturity of the IT activities describes how well developed are the single IT processes in this area depending on the technological level of the IT and the knowledge of the internal IT staff.

Willcocks and Currie (1997) also stated, from a technological perspective, datacentre and single service support (e.g. for application support) are discrete activities with high potential for outsourcing. Network and application development are more complex and strongly integrated in the IT environment and are more difficult to outsource. This case study shows that it is effective to identify the organisation’s key factors such as strategic goals, future needs, maturity of processes, level of integration and the costs of internal services compared with the free market. The present case study concludes that this case study is useful for my further research to find the right sourcing strategy of an organisation.
Centralisation to an internal service provider and selective outsourcing to several service providers on the basis of relatively short-term contracts successfully improved flexibility, reduced costs, and optimised quality of services and control over the IT activities in a fast changing environment. In this case study, the key factor is that the internal service provider is cheaper and better in some cases and this is often not considered in outsourcing decisions (Willcocks and Currie, 1997).

2.8.2. Case study of the Inland Revenue

In 1992, the British government’s Inland Revenue (IR) desired to optimise cost efficiency to 25% of all its activities in comparison with external service providers. The IR had an annual budget of 250 million pounds, with 13 data centres and a staff of 2400 IT specialists. In 1993, the IR made a 10 year contract with EDS, a large service provider with a volume of 1 billion pounds over 10 years, to save over 25 million pounds per year. IR enforced a total outsourcing strategy to EDS. Until 1996, nearly all IT staff members were transferred to EDS, except for 300 IT specialists who were retained at IR. The sweeping changes in the IT environment resulted in several problems with the internal IT specialists of IR.

In 1994, EDS overcharged extra money of 50 million pounds to unanticipated bills. In 1995, EDS forced IR again to pay 200 million pounds to cover unexpected costs over the lifetime of the 10 year contract. At this point, the outsourcing strategy failed because the primary objective was to save costs of 25 million pounds annually. The contract was also inflexible for the IR because EDS needed to forecast labour costs 13 month in advance. In 1995, the government wanted to save 3000 jobs with the introduction of a self-assessment tax scheme but this new project was not covered by the service contract with EDS. IR and EDS worked in collaboration but no one wanted to assume the responsibility for the projects that could destroy the trust in this relationship and lead to an unproductive IT environment. Therefore, EDS required additional resources.
Willcocks and Currie (1997) analysed the case and stated that the total outsourcing strategy was fundamentally risky with an expensive and inflexible 10 year contract with only one large IT service provider. In the history of IT outsourcing, the majority of the long-term total outsourcing deals with one large service provider were unsuccessful (Willcocks et al., 1996).

IR outsourced many IT processes with a low maturity which were highly integrated in complex systems. The problems in the relationship, the loss of skilled in-house specialists and the uncertainty of the long-term strategy led to the loss of control of the entire IT environment. All of these facts made the outsourcing risky, inefficient, expensive and unsuccessful. IR tried to outsource its IT problems but literature show evidence that this is often unsuccessful (Willcocks et al., 1996). All new projects were not part of the service contract and EDS could enforce the rules during the 10 year contract because of the high dependence. IR was not able to change the situation quickly nor could they change the provider owing to the high costs.

Willcocks et al. (1995) found in other cases that the service provider gains knowledge, whereas the customer loses it. In a total outsourcing strategy dependence to a single provider increases from year to year and the customer loses control of his or her IT. Moreover, the switching costs for every better solution are exorbitant. They also claimed that it is advantageous to the strategic supplier to increase this dependence and work against the interests of the customer. Willcocks et al. (1995) stated that the IR model of contractual organisation with long-term strategy of single carrier contracts should be replaced with a risk mitigating strategy of multiple providers on staged risk-reward contracts.

This case study shows the consequences of an organisation’s failure to identify the organisation’s key factors: strategic goals, future needs, maturity of processes, level of integration and finally the costs of internal services in relation to the free market. Willcocks and Currie (1997) found that in both the cases the in-house capabilities (especially the capabilities of business management, making technology work and supplier development) should be identified according to the core IT capability framework before outsourcing.
Willcocks and Currie (1997) provided two case studies as good and bad examples. The selective outsourcing strategy with short-term contracts with several service providers in combination with an internal service provider was a successful strategy for NHS. The total outsourcing strategy of a long-term contract with a single service provider was unsuccessful. The example of the IR raises a caution and should not be repeated. The example of the NHS could be a successful strategy plan for other outsourcing projects in the subject organisations.

The results of the two case studies could help the present study. I follow Willcocks and Currie’s opinion that centralisation to an internal service provider and selective outsourcing to several service providers on the basis of relatively short-term contracts successfully improved flexibility, reduced costs, and optimised quality of services and control over the IT activities in a fast changing environment. The key factor is that the internal service provider is cheaper and better in some cases and this is often not considered in outsourcing decisions. There are only a few studies on concerning IT outsourcing in the public service. In the history of German public service there is no example of such extreme IT outsourcing or changes in the IT infrastructure. No political party in Germany could introduce such extreme changes regardless of the financial situation of the federal state because of law restrictions and strong unions in the public services especially in North-Rhine Westphalia.

2.9. Comparison of outsourcing strategies of the public service and private companies

Kakabadse and Kakabadse published an article in 2001 in the journal of Public Administration and Development about their comparative analysis of outsourcing in the public service. In the public service outsourcing made no commercial sense but lot of political sense. The development of useful outsourcing methods for the public service is tardy because of the influence of an inflexible political system (Cole, 2001 cited by Kakabadse and Kakabadse, 2001).
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Thesis from Uwe Blind

Liberal governments in the past two decades have established a new philosophy in the public service “deliver value for money” (Halachimi and Montgomery, 2000, cited by Kakabadse and Kakabadse, 2001). Brereton and TAMPLER (1996, cited by Kakabadse and Kakabadse, 2001) stated that in the public service the politicians, civil servants and party advisers tried to optimise the services and reduce costs by searching for new solutions and ideas. A supporter of the new public service order argued that the civil servants should sovereignly manage the public service from formal organisations and should outsource services (OECD, 1997, cited by Kakabadse and Kakabadse, 2001). The British government outsourced huge tasks in the public service and still maintained a control over the new agencies and the finances through quangos (semi-public administrative body).

The Cranfield study from Kakabadse and Kakabadse (2001) based on 692 questionnaire responses and interviews of top managers of the public service and private companies in continental Europe, the UK and the USA. The objective was to find differences in the thinking of service delivery, financial service, performance management and cost discipline. The study revealed behind the reasons for outsourcing, the types of services outsourced and also the capabilities needed for an effective outsourcing. Kakabadse and Kakabadse (2001) found that following basic services, IT services are the most frequently outsourced activities in the professional services, the public administration and in the financial service. Financial service companies outsourced more of telecommunication and IT services than the public administration and the professional sector. The facility management is the fourth largest outsourcing services in the public administration.

Kakabadse and Kakabadse (2001) identified four key reasons for outsourcing decisions in the public service: achieving best practice solutions, improving the cost discipline of managers, improving the quality of service, and concentrating of the public service on its core tasks. In contrast, companies from professional services focus on best practise solutions and those from financial services consider reduction in transaction costs, head count and general costs.
Public service managers define the aforementioned four key competencies as non-critical to the future and current organisation of the public service. In contrast, the managers of private companies claim that the outsourced processes are critical for the current and future organisation of their companies. The main issue is that the managers in private companies already achieve higher benefits from their outsourcing strategy. Kakabadse and Kakabadse (2001) found that the public service frequently chooses supplier with prior experience in outsourcing projects in the public service. Furthermore, they stated that the large leading service providers such as SAIL, EDS and IBM are more preferred than the new niche providers. The right choice of the provider is eminently important for the success of the outsourcing strategy.

In the past, the public service decided on a few large providers (Willcocks and Currie, 1997 cited by Kakabadse and Kakabadse (2001)). In contrast, companies from professional and financial sectors chose internet service providers and small niche providers. In their study, Kakabadse and Kakabadse (2001) identified four core capabilities for managing outsourcing contracts:

1. Integration of the different working methods of external providers and own organisation.
2. Preparation of the organisation to ready for outsourcing.
4. Motivation of the lower management and the staff in the organisation to assist the outsourcing strategy.

Managers from all sectors claimed that they were capable and prepared to integrate outsourcing in their areas and to benchmark the quality of services against established standards. The know-how to identify potential activities and processes for outsourcing in line with the risk management is well developed across all sectors. Kakabadse and Kakabadse (2001) stated that managers across all sectors had similar experiences while outsourcing. The managers found it difficult to brief the staff regarding performance standards and other requirements. This is also the case for unexpected or expected contingencies.
Kakabadse and Kakabadse (2001) ascertained that the managers from all sectors also had similar experiences when managing their outsourcing contracts. In terms of monitoring performance against service levels, the public service is better than the other sectors. The managers of all sectors are well prepared selecting service providers and capturing previous outsourcing experience. Furthermore, they managed various outsourcing arrangements and transfer of resources. In this case, the public service is found to be weaker than the other sectors in motivating staff and management and improving of employees’ performance levels. The staff and management in the public service are less motivated than in the other sectors (Domberger, 1998 cited by Kakabadse and Kakabadse, 2001).

Both authors concluded that managers from all sectors experienced the following outsourcing experiences:

1. Loss of skills and know-how in the outsourced areas
2. Loss of research and development technology
3. Loss of flexibility and effectivity
4. Loss of opportunities to fulfil organisational and community requirements
5. Loss of motivation of the in-house staff due to job reduction and outsourcing

Managers from the public sectors described these outsourcing issues as more critical. They noticed a diminishing quality of relationship with their service providers with a high potential for conflict and disrespect between the partners. All of these lead to a hostile and distant relationship between the partners, which influence the success of the outsourcing strategy.

Kakabadse and Kakabadse (2001) concluded that outsourcing can be a powerful strategy to improve efficiency of public service. Managers from all sectors had similar outsourcing experiences and this is important for the transferability of the study results. Public sector managers have the same skills as managers from the financial and professional sectors but they are not able to compensate the negative aspects of outsourcing, for example, less motivated managers and in-house staff.

The public service has outsourced basic services, IT services and the facility management. The managers of the public sector experienced a negative impact on the functioning of the public service because of their outsourcing strategy.
Outsourcing of unnecessary and non-critical services and processes had strong influences on the public service efficiency. Although outsourcing is a political decision it still leads to disillusionment among the public service. The results of the study of Kakabadse and Kakabadse (2001) are vital for my present study for comparing the IT outsourcing strategies of private companies and the public service. There are only few studies concerning IT outsourcing in the public service in comparison with that in private companies, which underpins the importance of the present study results. It also shows that outsourcing is a two-edged sword because there is no guarantee that the public service would find the outsourcing strategy beneficial and it could also minimise its effectiveness.

The results from the present study are transferable to the public service because managers from all sectors had similar experiences but the private sector is more motivated to benefit from outsourcing. The positive and negative aspects of outsourcing in this study corroborate the results of the literature review. I conclude that the results highlight the importance of finding the right outsourcing strategy with a suitable provider. The public service also should learn from the private sector to develop up capabilities which are needed to assist a successful outsourcing strategy.

2.10. Conclusions of the literature review

The research question was to find out whether the IT governance and IT outsourcing strategies from large private companies would be practical for the NRW police. IT governance is a part of wider governance and IT outsourcing is a strategy within IT governance. Previous chapters have described how governance in private companies and in the public service works. The next logical step to underpin the research question is to define IT governance on the basis of the COBIT IT governance framework. Previous chapters provided background information about IT outsourcing, which helped to identify the reasons behind companies' IT outsourcing strategies. All the preceding information was necessary to understand the nine core IT capabilities framework from Lacity and Willcocks (2001) to exploit IT as a strategic resource.
I showed in the literature review how corporate governance, governance, IT governance, IT outsourcing and the nine core capabilities could be connected together to underpin the further research. I chose the COBIT framework to further corroborate this research, because this comprehensive IT governance framework addresses every aspect of IT (ISACA, 2012).

COBIT is the widely accepted framework for IT governance, used by many companies worldwide. I also discovered that the IT governance COBIT framework can be used for private companies and also public organisations. Willcocks et al. (1997) and Lacity and Willcocks (2001) developed a resource-based approach using the nine core IT capabilities framework to exploit IT as a strategic resource. This is the method is popularly accepted for case studies in the IT area. Therefore, it was sensible to combine the COBIT IT governance framework with the nine core capability framework for my further research. The literature review explained Moore's public value theory in comparison to private value. The theory of networked community governance is a new paradigm which can be used to modernise and optimise public services. It is important to understand that governance in private companies and public services works differently.

Since the nineties, IT outsourcing theory has undergone several paradigm shifts thanks to ever faster development of technology. In this context, I described the most common forms of IT outsourcing, although this is complicated by the fact that authors defined the terminology differently. Therefore, I used the diagram by Jouanne-Diedrich (2006), which contains the most common IT outsourcing terminology. The literature review does not include the IT outsourcing practice of European and American companies as this would go beyond the scope of my work. I emanated from my literature research that private companies adopt new IT trends earlier than public organisation such as the police.

In further sections, I analysed in which areas companies outsource and the reasons behind these decisions. In general, companies mostly outsource IT functions such as: network infrastructure, desktop services, helpdesk, user support, datacentre capacity, software and application hosting.
These findings were underpinned with information from different sources. Later sections describe the complexity of outsourcing and IT outsourcing market volume. Figures for the volume of IT outsourcing could be more detailed especially for public services; however, although I searched this information for a long time, I did not find anything.

Lacity and Willcocks (2014) found that many organisations do not optimise their back office due to high cost and lack of technical know-how. They use non-integrated, outdated IT solutions with redundant support services and inefficient, bureaucratic and non-standardised processes. The authors argued that an organisation can be transformed from having a messy back office to having a world-class IT service environment if the following five outsourcing transformation levers are implemented: centralisation, standardisation, optimisation, technology enablement and transfer to low-cost locations.

The results of their study close the gap in my research because standardisation, centralisation and optimisation are common trends in the IT; however these results were not supported by theory in the past. In the current study, I examine if Lacity and Willcocks (2014) transformation levers (centralisation, standardisation, optimisation, technology enablement and automation and labour transfer to low-cost location) were achieved in the subject organisations. In my research, I also demonstrate the advancement of an organisation that implements centralisation, standardisation and optimisation with respect to their IT infrastructure. It is expected that if an organisation achieves high levels of implementation in this way, it also has good IT governance in this area and a highly effective IT environment.

The BSI provides the GS tool that is already being used by the CISOs of the NRW police. The CISOs employ this tool to document the complete IT infrastructure and procedures in a database according to the BSI baseline security guidelines. The NRW police must fulfil these guidelines in accordance with the current law. In my study, I will also consider if the organisation has already implemented the BSI guidelines in accordance with the current law and use this as an indicator of how fast and effective the IT departments are in the subject organisations.
I conclude that the ISO 27001 is a necessary guideline for IT security in an organisation. The use of this guideline improves security and standardisation in an organisation. The achievement of this certification indicates how an organisation’s effectiveness in introducing security standards; therefore, it is a useful indicator for my further research.

My research investigates if the organisations used the important ITIL framework to document and structure their IT environments. Using this information, I determine how far an organisation has progressed with the introduction of ITIL and the maturity of the IT processes within the entire IT environment. BSI, ITIL and ISO 27001 are frameworks and standards to improve the effectiveness of an organisation’s IT environment. Willcocks et al. (2014) found that the standardisation and optimisation of the IT environment is necessary to establish a first-class service-orientated IT environment.

Willcocks and Currie (1997) provided two case studies as good and bad examples. The selective outsourcing strategy with short-term contracts with several service providers in combination with an internal service provider was a successful strategy for the NHS. The total outsourcing strategy of a long-term contract with a single service provider was unsuccessful. The case of IR raises a caution and should not be repeated. The case of NHS could be a successful strategy plan for other outsourcing projects in the subject organisations. The results of the two case studies could help the present study. I follow Willcocks and Currie’s opinion that centralisation to an internal service provider and selective outsourcing to several service providers on the basis of relatively short-term contracts successfully improved flexibility, reduced costs, and optimised quality of services and control over the IT activities in a fast changing environment. The key factor is that the internal service provider is cheaper and better in some cases and this is often not considered in outsourcing decisions. There are only a few studies on IT outsourcing in the public service; therefore, this source is important for my further research. I will prove whether the organisations use the selective outsourcing strategy because the full outsourcing strategy could be too risky and unsuccessful.
The results of the study by Kakabadse and Kakabadse (2001) are vital to my present study for comparing the IT outsourcing strategies of private companies and public service. There are only a few studies concerning IT outsourcing in the public service in comparison with that in private companies underpinning the importance of the results of the present study. It also shows that outsourcing is a two-edged sword because there is no guarantee that the public service would find the outsourcing strategy beneficial and it also could minimise its effectiveness.

The results from the present study are transferable to the public service because managers from all sectors had similar experiences; however, the private sector is more motivated to benefit from outsourcing. The positive and negative aspects of outsourcing in this study corroborate the results of the literature review. I conclude that the results highlight the importance of finding the right outsourcing strategy with a suitable provider.

The public service also should learn from the private sector to develop capabilities needed to undertake a successful outsourcing strategy. I agree with Huang et al. (2009) and Krisanthi et al. (2014) that COBIT focuses on how the maturity of IT processes could be measured and also how information is provided to fulfil business requirements. ITIL delivers best practise guidelines for IT management and processes. These guidelines are necessary and effective to document and improve IT processes in fast changing IT environments. The findings of Krisanthi et al. (2014) could help other organisations combine their IT frameworks with COBIT and ITIL. ISO 27001 is the necessary standard to guarantee the security of IT processes. Huang et al.’s (2009) findings could be a reference for other organisations when combining their IT frameworks with COBIT, ITIL and ISO 27001.

I conclude from these examples that the COBIT and ITIL frameworks are also flexible and powerful enough to be combined with other frameworks to develop a customised and highly effective framework that fulfils all the business needs of an organisation. All these results can contribute to further research because effective organisations should combine various IT frameworks and customise them in response to their business needs.
The combination and implementation of all these frameworks and standards improve the standardisation and optimisation of the organisation’s IT environment. However, Lacity and Willcocks (2014) found that the IT standardisation and optimisation optimise the entire IT environment. In my research, I will determine the extent to which an organisation has standardised and optimised its IT by using ITIL, COBIT, BSI, and ISO 27001 or other standards and frameworks. A high level of standardisation and optimisation in an organisation’s IT infrastructure is an indicator of good IT governance in this area and an effective IT environment.

The literature review is nearly exhaustive although some topics could have been addressed in more detail. In the methodology section, I developed a research framework combining COBIT and the nine core IT capability framework. I also created a questionnaire for the interviews based on the results of the literature review. After studying related literature, I discovered that the research theme was more than just a consultancy question because it also provides some new knowledge about IT sourcing in large public administrations. The results of the literature review confirm that the following methodology is the right way to start this research.
3. Methodology

3.1. Introduction

This methodology chapter consists of the following parts:

- comparison of quantitative and qualitative research
- research design and description of the used methods
- development of the research framework and the research model
- interview questions concerning COBIT focus areas
- calculation of IT outsourcing benefits

The first part of the chapter describes the differences between quantitative and qualitative research and explained why I chose to employ qualitative research. Further sections provide general information about case study research and explain why I chose to adopt Yin’s case study framework. Subsequent sections describe interview methods and how I defined the case study selection criteria for possible companies. I also explain why I combined the analysis of the multi case studies with a cross-case analysis and detail how I performed validity and reliability checks while minimising their limitations. The most important part of this chapter is the development of the chosen research framework on the basis of the COBIT (ITGI, 2006) and nine core IT capabilities (Lacity and Willcocks, 2001) frameworks. For the case study interview, I developed questions about COBIT focus areas which fit in my research model. The final part of this chapter explains how IT outsourcing benefits were calculated which was necessary to analyse the case study results.
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3.2. Comparison of quantitative and qualitative research

In the quantitative research the researcher build up a framework based on the literature review and on existing IT outsourcing theories. In a further step he will define hypotheses and null hypotheses which will be tested with deductive logic.

<table>
<thead>
<tr>
<th>Deduction emphasises</th>
<th>Induction emphasises</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ scientific principles</td>
<td>➢ gaining an understanding of the meaning humans attach to events</td>
</tr>
<tr>
<td>➢ moving from theory to data</td>
<td>➢ a close understanding of the research context</td>
</tr>
<tr>
<td>➢ the need to explain causal relationships between variables</td>
<td>➢ the collection of qualitative data</td>
</tr>
<tr>
<td>➢ the collection of quantitative data</td>
<td>➢ a more flexible structure to permit changes of research emphasis as the research processes</td>
</tr>
<tr>
<td>➢ the application of controls to ensure validity of data</td>
<td>➢ a realisation that the researcher is part of the research process</td>
</tr>
<tr>
<td>➢ the operationalisation of concepts to ensure clarity of definition</td>
<td>➢ less concern with the need to generalise</td>
</tr>
<tr>
<td>➢ a highly structured approach</td>
<td></td>
</tr>
<tr>
<td>➢ researcher independence of what is being researched</td>
<td></td>
</tr>
<tr>
<td>➢ the necessity to select samples of sufficient size in order to generalise conclusions</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Major differences between deductive and inductive approaches to research
(Saunders et al., 2007)

Deduction is a procedure to draw logical conclusions from a general issue to a special one. This means that we can achieve special findings from a general theory. In contrast to deduction is induction. It is a generalised conclusion from a broad range of different observations or issues. In the past scientists used this research method to draw conclusions, for example from several natural phenomena in the laws of nature (Remenyi et al., 2005). I will not use quantitative methods for my research because the following methods are more effective to get reliable results. In the following are the research methods of my qualitative research.
3.3. Research design and description of the methods

3.3.1. Document analysis

Records, documents, artefacts and archive constitute a particularly rich source of information about many organisations and programs. Hill (1993, cited in Patton, 2002) said that archival strategies and techniques are an important part of field research and evaluation. In my research this part assisted me to get a deeper view of the common IT outsourcing theories, strategies and trends in this research field. In this phase I could analyse data of external sources about outsourcing theories and strategies in this field. With the analysis of internal sources I wanted to understand the current IT situation and outsourcing strategies in the NRW police. This information helped me to validate the calculations and the development of alternative models or explanations.

Data of the researched organisations were obtained from their official internet websites, whereas the police department’s data were from the Cooperate Network Police (CN-POL) intranet. I categorised the data from general information of the organisations, organisational structure, business aims, risks and opportunities. An overview of the organisation was necessary to understand the processes, organisational environment and results of the researched case. In the literature review I searched in research databases, official websites of the organisation and books. I sorted the data in the main themes corporate governance, governance in the public administration, IT governance, COBIT, ITIL, BSI and ISO framework, IT outsourcing and the nine core IT capability framework (Lacity and Willcocks, 2001). All information was critically reviewed to evaluate the accuracy and their value for my present study. Academic journals from research databases and books were preferred for my research and Saunders et al. (2009) structure was used for the literature review.

1. Started from a general level narrating down to my specific research question.
2. Provided a brief overview of themes and ideas at the beginning.
3. Summarised and compared the findings from the various literatures.
4. Narrated how the findings from the literature are relevant for my study.
5. Evaluated how these finding provided fresh aspects to my study.

After the end of each subchapter in the literature review, conclusions are drawn on the basis of Saunders et al. (2009) checklist for evaluating the relevance and value of the literature for my study.

1. How recent is the literature?
2. Does the literature meet my study’s relevance criteria for inclusion?
3. Have the seen references in other literature sources been checked that would assist my current research?
4. Does the literature assist or deny the study’s aims and objectives?
5. Is the literature valuable and precision sufficient for my present study?
6. Is the literature biased and needs to be more critically reviewed?
7. Is the literature supported by other sources?

3.3.2. Triangulation

Triangulation is a researcher strategy for which data or methods from different sources are used. The aim of this research method was to achieve more valid results whilst reducing the possibility of systematic errors.

Denzi (1978b, cited by Patton, 2002; cited by Yin, 2009) identified four types of triangulation:

1. The use of different data sources in a study is called data triangulation.
2. The use of several evaluators and researchers is called investigator triangulation.
3. The use of several different theories to interpret the data is called theory triangulation.
4. The use of different methods to perform the study and to analyse the data is called methodological triangulation.

Many scientists are the opinion that the triangulation research method leads only to more data and not to more valid results (Sekaran, 2003; Yin, 2009).
The present study used data triangulation because data were acquired from different sources such as interviews and document analysis to mitigate errors in my research. I used data triangulation for this research therefore four interviews were performed in the NRW police. Patton (2002) stated that studies which only use data from one method are more biased than those that provided data from multiple sources provides cross-data validity checks. Furthermore, I also used methodological triangulation because I performed in my research a multiple-case analysis and later a cross-case analysis. Saunders et al. (2009) discussed that multiple-case methods involve more than one data collection technique and analysis procedure for the study.

3.3.3. Case study research

Benbasat et al. (1987), in the journal MIS quarterly, characterised IT as an area where technology changes quickly and constantly. The researchers studied innovations developed by practitioners without providing the initial rationale behind these new ideas. They wrote that no single strategy is suitable for all research topics. Furthermore, Benbasat et al. (1987) proved that research strategy is influenced by the nature of the research and its aims. Bonoma (1983) stated that case studies are useful to research practical problems that depend on the actors’ experiences and the critical context of the action. Yin (2009) defined that case study research should be used if theory is at an early, formative level. Benbasat et al. (1987) argued that case study research strategy is perfectly suited to collecting the knowledge of practitioners and developing theories from it. He further concluded that there are three reasons to perform case study research in IT.

1. The researcher generates theories from practice because he can research IT in natural settings and learn about the current knowledge.
2. Case study research allows the researcher to understand complex processes by asking “how” and “why” questions.
3. Case study research in IT can be easily combined with research data from previous studies. This is necessary due to fast technology development and paradigm changes in this field.
Benbasat et al. (1987) argued that there is no standard definition for case studies. A case study examines the natural setting of a phenomenon by using multiple data collection methods to obtain information from organisations, people and groups. No experimental manipulations or controls are used in this type of research, where the extent of the phenomena is not clearly obvious at the outset (Benbasat et al., 1987). Benbasat et al. (1987) identified three forms of case study in qualitative research: application description, action research and case study research. An application description is written by practitioners but this is not strictly a case study research because the author does not conduct any research. It is merely a cooking recipe of things that should be done or not. Action research is a study method in which the researcher is a participant in the subject of the research.

This research is strongly influenced by the researcher. He can solve problems in the system and develop it further but the achieved results will be biased all the time. According to Benbasat et al. (1987), the researcher in case study research is an observer who conducts studies to prove specified research questions. How to conduct a case study research is also not clearly defined in literature. The following is a table of Bonoma’s and Yin’s research framework. Bonoma (1983, cited in Yin, 2009) stated that case study research strategy can be used to underpin the hypothesis development and testing. In contrast to this Yin argued in 1984 that case study research data is useful to explain phenomena.

<table>
<thead>
<tr>
<th>Traditional phases of knowledge accrual</th>
<th>Yin’s framework</th>
<th>Bonoma’s framework</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>Description</td>
<td>Drift</td>
<td>Single/ multiple case(s)</td>
</tr>
<tr>
<td>Hypothesis generation</td>
<td>Exploration</td>
<td>Design</td>
<td>Multiple cases</td>
</tr>
<tr>
<td>Hypothesis testing</td>
<td>Explanation</td>
<td>Prediction</td>
<td>Multiple cases</td>
</tr>
<tr>
<td>Confirmation</td>
<td>Explanation</td>
<td>Disconfirmation</td>
<td>Single critical case</td>
</tr>
</tbody>
</table>

Table 8: Terminologies for stages of case research programmes (Yin, 2009)
3.3.4. Case study flow chart

Yin (2009) said that the flow chart for case study research should be like the diagram above. In the following I developed a flow chart for the research in which I did not used an iterative process because there were several relatively small case studies. It was quite clear how to develop the research therefore it was not necessary to go back in the flow chart to redesign or adapt the collection or the analyse methods. For the research of more complex problems or for large multi case studies Yin’s method was more useful.

The terminology which was used in this chapter is explained in the appendix. In literature the term case study is sometimes defined only as a data collection method and not as an independent method. Yin (2009) said that this definition is not enough. Schramm (1971, cited in Yin, 2009, p. 17) said: “The essence of a case study, the central tendency among all types of case study is that it tries to illuminate a decision or a set of decisions: why they were taken, how they were implemented, and with what result.” For the research of multi case studies it could be necessary to go back in the flow chart to redesign or adapt the collection or the analyse methods.

![Case study research flow chart](Yin, 2009, p.2)
3.3.5. Research process

In the following I developed a flow chart for my research in which I used Yin’s (2009) iterative case study process.

The review of the literature of the police or about the outsourcing topics helped me to get a deeper view about these themes.

In the study objective phase I defined the settings of my research task and develop a research framework.

In this phase of the pilot studies I questioned key informants from one large police authority.

I used the data triangulation method to achieve more valid results. For this method I combined interviews, participant observations and document analysis.

In the phase of the data analysis I used the method of explanation building, logical models which were guided by the theoretical propositions.

At the end I wrote the conclusions which I made through my research about this topic.

Figure 20: Research design flow chart
3.3.6. Unit of analysis

Patton (2002) stated that the design specifies the unit of analysis to be researched. However, the unit of analysis influences the decisions about on sampling and sampling strategy. Yin (2009) defined that the probable definition of the unit of analysis (which is equal with the definition of the case) is influenced by the definition of the initial research question. He further discussed that the selection of the right unit of analysis starts with the accurate specification of the primary research question. Therefore, I concluded that the right choice of the unit of analysis is very important for my further research. Yin (2009) stated that sometimes the defined unit of analysis in the research differs from a being studied phenomena.

The choice of the unit of analysis is influenced by the results of data collection. Patton (2002) found that the strength of qualitative analysis lies in looking holistically at programmes or organisations. The community, programme or organisation become the focus of the case study in these cases and excludes interviewed individuals. In the present study the unit of analysis in my research is defined as the IT units in the researched organisations and companies. This also fits to my primary research question: Are the IT outsourcing strategies and IT governance outsourcing strategies of large companies practicable for the NRW police and in which issues do they differ?

3.3.7. Pilot study

I followed Yin’s (2009) case study methodology which included pilot studies as a preliminary step to the actual research. This was more than a test for Yin because due to the results of pilot studies the researcher knows the weaknesses and strengths of his case study methodology. Saunders et al. (2002) wrote that a pre-test increases the validity of the collected data and also allows for optimisation of the questionnaire or interview questions. I carried out the pre-test in my network department of the police authority Hagen because I wanted to organise interviews with IT managers of the NRW police. Advantages were that I knew the environment and it was therefore easy to prove whether the interview structure would deliver sensible data.
Although the interview consists of over seventy questions, each of the interviews only lasted approximately 60-80 minutes. My pilot test indicated that some questions were not clearly formulated because they were more appropriate for private companies than public administration. I changed the structure of these questions and in subsequent interviews with IT managers in public administration I could describe the similarities in the public service, e.g. for questions regarding economic topics. I also relegated the questions regarding outsourcing to the end of the interview because, at this point, the respondent developed a feeling important for my research. This also reduced biased answers increasing the validity of the data. In my pilot case study the IT manager of the network department did not know the questions before the interview and was therefore unable to answer all the questions because some were not directly related to his daily job. The solution to this problem was to send the interview questions to the respondent beforehand, since the IT tasks in large companies are often divided among several different departments. The advantage was that the respondent had the opportunity to obtain the required information in order to answer all interview questions.

3.3.8. Research documentation

<table>
<thead>
<tr>
<th>Research phases</th>
<th>Research documentation (thesis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature Review</td>
<td>Chapter two</td>
</tr>
<tr>
<td>Research framework</td>
<td>Chapter one - research question</td>
</tr>
<tr>
<td></td>
<td>Chapter two - research model</td>
</tr>
<tr>
<td></td>
<td>Research methodology chapter three</td>
</tr>
<tr>
<td>Pilot Case Study</td>
<td>Pilot case study test interviews in the public service</td>
</tr>
<tr>
<td>Data collection</td>
<td>Chapters four to twelve - case descriptions</td>
</tr>
<tr>
<td>Multi-case studies</td>
<td>Chapters six to twelve - analysis of the single cases</td>
</tr>
<tr>
<td></td>
<td>Chapters six to twelve - case summaries</td>
</tr>
<tr>
<td>Single-case analysis</td>
<td>Chapter thirteen - cross-case results</td>
</tr>
<tr>
<td>Cross-case analysis</td>
<td>Chapter thirteen - data analysis</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Chapter fourteen:  - Contributions and implications</td>
</tr>
<tr>
<td></td>
<td>- Summary of the results</td>
</tr>
<tr>
<td></td>
<td>- Limitation of the results</td>
</tr>
<tr>
<td></td>
<td>- Reflective diary</td>
</tr>
</tbody>
</table>

Table 9: Research documentation phases
3.3.9. Interview types

Saunders et al. (2007) stated that there are two different groups of interviews, standardised and non-standardised ones. For my thesis I used non-standardised interviews. This interview type is subdivided in the two groups one-to-one and one-to-many. One-to-many means that the researcher interviews many respondents at the same time. It was not necessary to use this interview form in my research. The group one-to-many consists of the interview forms face-to-face, telephone and electronic interviews (Casell et al., 2006). In my research I used the face-to-face and the telephone interview because they fitted into the research task better. The terminology was explained in the appendix. The interviews should show the opinion of the IT managers about IT outsourcing in general and especially for their projects. In these interviews it was also possible to get an impression of their subjective feelings about the IT strategy. However, data about their ideas to optimise the strategy and processes could be collected in this way.
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Telephone interviews
In the research I used telephone interviews because they fitted into the research task better. The interviews should show the opinion of specialists responsible for IT about outsourcing in general and especially for their projects. In these interviews it was also possible to get an impression of their subjective feelings about IT outsourcing. However, data about their ideas to optimise this process could be collected in this way. In a telephone interview the interviewer asks the respondent on the phone. The advantage is that the interviewer has no geographical limits (Saunders et al., 2007). I questioned many respondents from all over North Rhine-Westphalia in a short time. For many respondents it is easier to answer the question by phone because this is more anonymous (Cassell et al., 2006).

Face-to-face interviews
Sekaran (2003) stated that face-to-face interview means that the interviewer is seated opposite to the respondent and asks the questions. The advantage of this method is that the interviewer sees the reaction and the emotions of the respondent. Furthermore, he can clarify doubts and ensure that the responses are properly understood. The disadvantage is that the interviewer must travel to the respondent. For some respondents it is difficult to answer the interviewer face to face (Sekaran, 2003). I used the face-to-face method to interview the IT-managers in the police authorities in Dortmund and Hagen because they were quite near together. This method was also used in the interview with the CEO of Ruhrpumpen. For the interviews with the interview partners at the LZPD, MIK, Bertelsmann, Telekom and T-Systems I also used telephone interviews because it was easier to arrange appointments in this way and I would have to travel a long distance to travel to see them.
3.3.10. Observational studies
Saunders et al. (2007) defined that the observational studies can be subdivided in participant and non-participant observation. In the participant observation method the researcher plays a role as a part of the researched organisation and in this way gets a deeper view in the processes. This observation can be either structured or unstructured. In the first case the observer knows which activities or phenomena he plans to study, this is called structured observational study. The observer of an unstructured observational study observes the organisation to get his findings (Patton, 2002; Saunders et al., 2007). I work as a group manager of a network department in the public administration of a medium-sized police presidium with 750 employees. In my research I used the structured participant observation because I work in the IT and I know how the processes work. The advantage was that I had full access to personnel, data and locations. My years of experience helped me to find out the advantages and disadvantages of the different IT processes and how they could be optimised.

3.3.10. Case study selection criteria
Patton (2002) identified several purposeful sampling methods. Extreme or deviant case sampling is used in the present study. Patton (2002, pp. 243) defined it as: “Learning from unusual manifestations of the phenomena of interest, for example, outstanding successes/ notable failures; top of the class/ drop out; exotic events; crises.” This sampling method is reasonable for achieving more valid data in comparison with the data in case the samples are nearly equal. Patton (2002, cited by Saunders, 2009) stated that findings from extreme cases are important to provide more valuable results for understanding of the research question. These data increase the transferability of the results to understand the situation in other organisations.

The present study also utilised the maximum variation case sampling according to Patton (2002) in order to have companies from different sectors (multi-media telecommunication and industrial production), and police authorities from different types Ministry of the Interior, Police Presidium Hagen, Police Presidium Dortmund and LZPD (service provider of the NRW police).
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<table>
<thead>
<tr>
<th>Typ</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random probability sampling</td>
<td>Representativeness: Sample size a function of population size and desired confidence level.</td>
</tr>
<tr>
<td>Simple random sample</td>
<td>Permit generalisation from sample to population it represents.</td>
</tr>
<tr>
<td>Stratified random and cluster themes</td>
<td>Increase confidence in making generalisations to particular subgroups</td>
</tr>
<tr>
<td>Purposeful sampling</td>
<td>Select information-rich cases strategically and purposefully; specific type and number of cases selected depends on study purpose and resources</td>
</tr>
<tr>
<td>Extreme or deviant case (outlier) sampling</td>
<td>Learning from unusual manifestation of the phenomenon of interest, for example, outstanding successes/ notable failures; top of the class/ drop outs; exotic events; crises.</td>
</tr>
<tr>
<td>Intensity sampling</td>
<td>Information-rich-cases that manifest the phenomenon intensely, but not extremely.</td>
</tr>
<tr>
<td>Maximum variation sampling</td>
<td>Document unique or diverse variations that have emerged in adapting to different conditions. Identify important common patterns that cut across variations ( cut through the noise of variation)</td>
</tr>
<tr>
<td>Homogeneous sampling</td>
<td>Focus; reduce variation; simplify analysis; facilitate group interviewing</td>
</tr>
<tr>
<td>Typical case sampling</td>
<td>Illustrate or highlight what is typical, normal, average.</td>
</tr>
<tr>
<td>Critical case sampling</td>
<td>Permits logical generalization and maximum application of information to other cases because if it is true of this one case, it is likely to be true of all other cases.</td>
</tr>
<tr>
<td>Snowball or chain sampling</td>
<td>Identify cases of interest from sampling people who know people who know people who know cases are information rich, that is, good examples for study, good interview participants.</td>
</tr>
<tr>
<td>Criterion sampling</td>
<td>Picking all cases that meet some criterion, for example, all children abused in a treatment facility. Quality assurance.</td>
</tr>
<tr>
<td>Theory-based sampling</td>
<td>Finding manifestations of a theoretical construct of interest so as to elaborate and examine the construct and its variations.</td>
</tr>
<tr>
<td>Convenience sampling</td>
<td>Do what is easy to save time, money and effort. Poorest rationale; lowest credibility. Yields information-poor cases.</td>
</tr>
<tr>
<td>Combination or mixed purposeful sampling</td>
<td>Triangulation; flexibility; meet multiple interest and needs</td>
</tr>
</tbody>
</table>

Table 10: Sampling methods (Patton, 2002)
These organisations were selected for to a broad overview of the IT outsourcing strategy in various organisations. The Police Presidium Hagen has over 650 employees and over 600 police students. Companies should have nearly the same number of employees as the PP Hagen. Specific criteria were used to select suitable companies for this research. Firstly, the company should only be a large company with over 1,000 employees working in different locations. Secondly, the company should have a large heterogenic network with several hundred PCs. Thirdly the company should have a clear sourcing strategy which meant they had a clear position regarding outsourcing. It was necessary at this point to know how successful outsourcing was in terms of IT governance. It was also important that the company was not only an IT service provider because this could provide false results. Companies in all industries were considered because I wanted an overview of the current outsourcing practices of large companies in Germany. The results were comparable because the companies used the same or similar hardware and software and the IT processes did not differ too much from one to the other. I undertook a pilot study in the Hagen police presidium.

In the data collection phase I interviewed the IT managers of the large presidium of Dortmund (3,500 employees), the medium presidium of Hagen (1250 employees), the LZPD (1,350 employees) and the police’s strategy department in the Ministry of the Interior (MIK). It was not possible to interview all police authorities, but the sample above was a good solution to get an overview of the current situation with the police. The official statements of the Ministry of the Interior (MIK) were important to this research. The interviews were conducted at Dortmund PP, Hagen PP and the LZPD to corroborate the statements by the MIK. I assumed that the results of this thesis will be transferable to the other police authorities because they share the same organisational structure, hardware and software equipment. Furthermore, I also interviewed IT managers at the large companies Ruhrpumpen, Bertelsmann, Telekom and T-Systems and compared the results.
3.3.11. Methods of analysis in the research

Yin (2009) defined five analytic techniques: pattern matching, explanation building, time-series analysis, logic models and cross-case synthesis. In the current research all of the analytic techniques were used except for the time-series analysis. The analytic induction is used to identify patterns, themes and categories in the qualitative data of a case study. The early stages of qualitative analysis are inductive, and particularly when a codebook is defined to find possible patterns, themes or categories. If the patterns, categories or themes are confirmed through inductive analysis, then in the final deductive method can be used (Patton, 2002).

My case studies were exploratory and, according to Yin (2009), the patterns were related to the dependent and independent variables of the study. This current study used explanation building, which was a special type of pattern matching. However, this procedure was more complicated than pattern matching. Moore’s public value theory was used to explain the results of the interviews with the police. The aim was to compare the findings of the single cases with Moore’s (1995, 2011) theory. Yin described (2009) logic model as an increasingly useful method in doing case study evaluations. The model was defined by the questions of the framework, for example, the ITIL best practise or the COBIT IT governance framework.

If one of the required processes in the chain did not exist in the company, I could evaluate the maturity of the process chain. Cross-case synthesis can be conducted as individual case studies from different researchers or as a part of the same research. The method is the same as for separate research syntheses collecting findings across single case studies (Yin, 2009). Glaser and Strauss (1967, cited in Patton, 2002) stated that the cross-case analysis begins with a definition and searches for patterns and themes that criss-cross individual experiences. The main focus is to understand the single case before all the cases are thematically sorted and compared with each other. This is necessary to guarantee that the discovered pattern and emergent categories have a basis for their context and also in the specific cases (Patton, 2002). In this research the results from single cases were compared due to the defined patterns of economic, strategic and technical benefits.
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The combination of the core IT capability framework (Lacity and Willcocks, 2001) and the COBIT IT governance framework helped to categorise and identify cross-case patterns that were necessary to compare the single cases with each other. Yin (2009) stated that pattern matching logic is one of the most desirable case study techniques. Empirically based patterns are compared with several alternative predictions or predicted ones (Trochim, 1989, cited by Yin, 2009). The findings could increase the internal validity of a case study. Yin (2009) claimed that a multiple case study had pattern matched the events in each case with different or similar theoretical predictions. However, in a final step the findings are tested with replication logic in a cross-case analysis.

Kakabadse and Kakabadse (2001) stated that the public service can use the outsourcing strategies similar to private companies because they work with the same IT and have the same IT outsourcing problems. If similarities were found in the IT strategies of the researched organisations or companies I can transfer the findings to other cases as well. If all organisations used similar IT strategies, then they can be useful for the NRW police as well.

Willcocks et al. (2014) defined a method for developing of an effective back office. If this method was to be used the findings would fit with the predicted pattern. The centralisation of IT leads to more efficiency. Standardisation of hardware, software and processes optimises the IT. Development of an internal IT service provider who fulfils all centralised IT task optimises cost and processes. If the results are replicable across the multiple case and cross-case analysis, then they are transferable to other cases and useful for the NRW police as well.

Lacity and Wilcocks (2001) defined the core IT capability framework to evaluate the maturity of IT governance. If the companies have developed high capabilities and have good IT governance their strategies and methods are useful for the police to improve their core IT capabilities.

Willcocks and Currie (1997) stated that a selective IT outsourcing strategy with short-term contracts with several providers is more successful than a full IT outsourcing strategy with long-term contracts with one provider.
If one of these two IT outsourcing strategies is found in the researched cases, then the study results may be in line with those from Willcocks and Currie. If the results are replicable across the multiple case and cross-case analysis they are transferable to other cases and useful for the NRW police.

3.3.12. Theoretical propositions

Yin (2009) stated that even an explorative case study should have statements about what is researched and also should have purpose and successful criteria for the exploration. The present study is an explorative and in the following are statements what is researched.

- The study attempts to prove whether Moore’s theory (1995, 2011) is appropriate for the NRW police.
- The present research also examined whether the researched organisation used a selective or a full outsourcing strategy. The findings from the literature review showed that it is risky to use a full outsourcing strategy and may be unsuccessful.
- The study tries to find if the organisations or companies achieve economical, technological and strategic benefits, which can aid in calculating their overall outsourcing success.
- The finding from the literature review showed that it is important for the effectiveness of the IT to use frameworks and standards. The present study examined whether the COBIT, ITIL, BSI and ISO 27001 frameworks and standards are used.
- The Lacity and Willcocks (2001) core IT capability framework was used to evaluate the effectiveness of the IT in the researched organisations. If the researched organisation has developed high core IT capabilities than the maturity of their IT governance could be evaluated.
The present study also verified whether the researched organisation used the methods by Willcocks et al. (2014) to develop a highly efficient back office. If the researched organisation used these methods successfully, it implies that such methods are also useful for the NRW Police.

Finally, the present study aims to prove whether the developed research model fits the study objective or needs improvements.

3.3.13. Validity and reliability checks in qualitative research

In the following I described which reliability and validity checks I made to confirm the results.

**Construct validity:** identifying correct operational measures for the concept being studied (Yin, 2009, p. 40)

**Internal validity:** seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships (Yin, 2009, p. 40)

**External validity:** defining the domain to which a study’s findings can be generalised (Yin, 2009, p. 40)

**Reliability:** demonstrating that operations of a study – such as the data collection procedures – can be repeated, with the same results (Yin, 2009, p. 40)
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<table>
<thead>
<tr>
<th>Tests</th>
<th>Case Study Tactic</th>
<th>Phase of research which tactic occurs</th>
<th>Tactics of this thesis</th>
</tr>
</thead>
</table>
| **Construct validity** | ➢ use multiple sources of evidence  
➢ establish chain of evidence  
➢ have key informants review draft case study report | data collection  
data collection  
composition | data triangulation of literature resources  
multi-case studies  
discussion with interview partner or other key informant about the report |
| **Internal validity** | ➢ do pattern matching  
➢ do explanation building  
➢ address rival explanation  
➢ use logic models | data analysis  
data analysis  
data analysis  
data analysis | use of analytic induction |
| **External validity** | ➢ use theory in single-case studies  
➢ Use replication logic in multi-case studies | research design  
research design | multi-case studies approach |
| **Reliability** | ➢ use case study protocol  
➢ develop case study database | data collection  
data collection | Case study protocol |

Table 11: Case study tactics for four design tests (Yin, 2007; Mitteregger, 2009)
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For construct validity I used multiple sources in the data collection phase like interviews, observation and document analysis. At the end a key informant of the interviewed organisation checked the draft version of the report. For internal validity I built up explanations about the examined case in the data analysis phase and I also addressed rival explanations at this stage. To understand the flow chart of the case I developed logical models and alternative models for the research (Yin, 2009). In the research design phase I used the external validity of the outsourcing theory to prove that the complete outsourcing of the desktop services saves costs and optimises a business. For reliability I used a case study protocol during the data collection and developed a case study database in Excel.

In this research I also used the chain of evidence to check the reliability. This principle allows an external reader of the case study to follow the derivation of any evidence from the initial research question to ultimate conclusions (Yin, 2009).

Figure 22: Maintaining chain of evidence (Yin, 2009)
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3.3.14. Limitation of the methods used

<table>
<thead>
<tr>
<th>Sources of evidence</th>
<th>Strength</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation</td>
<td>• stable - can be reviewed repeatedly</td>
<td>• retrievability - can be difficult to find</td>
</tr>
<tr>
<td></td>
<td>• unobtrusive - not created as a result of the case study</td>
<td>• biased selectivity, if collection is incomplete</td>
</tr>
<tr>
<td></td>
<td>• exact - contains exact names, references and details of an event</td>
<td>• reporting bias - reflects (unknown) bias of author</td>
</tr>
<tr>
<td></td>
<td>• broad coverage - long span of time, many events and settings</td>
<td>• access - may be deliberately with held</td>
</tr>
<tr>
<td>Archival Records</td>
<td>• same as those for documentation</td>
<td>• same as those for documentation</td>
</tr>
<tr>
<td></td>
<td>• precise and usually quantitative</td>
<td>• accessibility due to privacy reasons</td>
</tr>
<tr>
<td>Interviews</td>
<td>• targeted - focuses directly on case study topics</td>
<td>• bias due to poorly articulated questions</td>
</tr>
<tr>
<td></td>
<td>• insightful - provides perceived causal inferences and explanations</td>
<td>• response bias</td>
</tr>
<tr>
<td></td>
<td>• access due to extremely restricted access to case data</td>
<td>• inaccuracies due to poor recall</td>
</tr>
<tr>
<td>Direct observations</td>
<td>• reality - covers events in real time</td>
<td>• reflexivity - event may proceed differently because it is being observed</td>
</tr>
<tr>
<td></td>
<td>• contextual - covers context of “case”</td>
<td>• cost - hours needed by human observers</td>
</tr>
<tr>
<td>Participant observation</td>
<td>• same as above for direct observations</td>
<td>• same as above for direct observations</td>
</tr>
<tr>
<td></td>
<td>• insightful - into interpersonal behaviour and motives</td>
<td>• bias due to participant-observer’s manipulations of event</td>
</tr>
<tr>
<td>Physical artifacts</td>
<td>• insightful into cultural features</td>
<td>• selectivity</td>
</tr>
<tr>
<td></td>
<td>• insightful into technical operations</td>
<td>• availability</td>
</tr>
</tbody>
</table>

Table 12: Six sources of evidence (Yin, 2009, page 102)
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The following will explains how I mitigated the weaknesses of the chosen methods. Documentation analysis can be biased by author selectivity. I reduced this biased by collecting a wide range of documents from different sources and authors. The choice of documents should be nearly exhaustive and I analysed all the documents carefully and critically. The interviews are always influenced by the interviewer. Poorly articulated questions can also introduce errors. In addition, interviewee responses are often biased for various reasons. To counteract this, I thoroughly prepared and tested my interview questions to reduce errors due to poorly articulated questions.

My interview and note-taking skills improved consistently throughout the data collection phase allowing me to transcribe the answers quickly and thoroughly in shorthand. After each interview I reviewed the answers and transferred everything to an electronic format. In the case of further questions I contacted the interviewee again.

For this research I only interviewed key decision makers in high positions within their organisation. These highly skilled IT managers had a complete overview of their IT organisation and were able to answer nearly every question. I was able to significantly reduce incorrect answers by sending them all questions before. Where it was possible, I also discussed my case study results with the interviewee to prove the validity and reliability of my data.

I used the participant observation method to understand how IT works within the police, even though the participant observer always manipulates events directly or indirectly. My solution to this problem was that I already had access to all the necessary information. I worked for more than 14 years as an IT manager of a network department during which I collected a lot of knowledge and experience about IT development in the police.
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3.4. Research framework with research model

The methodology of this research was influenced by the thesis of Mitteregger (2009), who researched outsourcing capabilities of small and medium-sized companies. In a multiple case study, he interviewed CEOs of 10 small- and medium-sized companies. However, he developed a good methodology and he also used the COBIT framework. He further developed diagrams for the success of IT outsourcing with economic, technological and strategic benefits. The findings of his research are not transferable to my present study because the largest company in his research employed less than 100 people. In most cases, companies of this size have no real IT and have outsourced nearly all IT services. However, his research showed that it is sensible to use the COBIT framework for the IT governance and to measure the effectiveness of the IT with Lacity and Willcocks (2001) core IT capability framework. In the present study, IT governance and IT outsourcing in large companies were considered and, therefore, I concluded that his methodology can be used.

The research framework was adapted from the COBIT 4.1 IT governance focus area model. The COBIT framework consists of the five IT governance focus areas strategic alignment, value delivery, risk management, resource management, performance management and the four domains (plan and organise, acquire and implement, deliver and support, monitor and evaluate). Each focus area was researched within of the four domains and other methods which were described in this chapter. The important COBIT processes of the four domains were the basis for the questions in the questionnaire.

The terminology of the COBIT processes was, for example, P01 means “plan and organise”, i.e., the first process or all means acquire and implement one process. The importance of the process was rated in the following scale: “L” for low importance, “M” for medium importance and “H” for high importance. In the diagram, the “P” stands for primary relationships of the domain process with the focus area, and vice versa, “S” stands for the secondary relationship.
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**Plan and Organise**

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>P01 Define a strategic IT plan</td>
<td>H</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P02 Define the information architecture</td>
<td>L</td>
<td>P</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>P03 Determine technological direction</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>P04 Define the IT processes, organisation and relationships</td>
<td>L</td>
<td>S</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P05 Manage the IT investment</td>
<td>M</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>P06 Communicate management aims and direction</td>
<td>M</td>
<td>P</td>
<td>P</td>
<td></td>
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</tr>
<tr>
<td>P07 Manage IT human resources</td>
<td>L</td>
<td>P</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>P08 Manage quality</td>
<td>M</td>
<td>P</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P09 Assess and manage IT risks</td>
<td>H</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P10 Manage projects</td>
<td>H</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

**Acquire and Implement**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Importance</th>
<th>Strategic Alignment</th>
<th>Value Delivery</th>
<th>Resource Management</th>
<th>Risk Management</th>
<th>Performance Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI1 Identify automated solutions</td>
<td>M</td>
<td>P</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>AI2 Acquire and maintain application software</td>
<td>M</td>
<td>P</td>
<td>P</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI3 Acquire and maintain technology infrastructure</td>
<td>L</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI4 Enable operation and use</td>
<td>L</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>AI5 Procure IT resources</td>
<td>M</td>
<td>S</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI6 Manage changes</td>
<td>H</td>
<td>P</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI7 Install and accredit solutions and changes</td>
<td>M</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

**Delivery and Support**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Importance</th>
<th>Strategic Alignment</th>
<th>Value Delivery</th>
<th>Resource Management</th>
<th>Risk Management</th>
<th>Performance Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1 Define and manage service levels</td>
<td>M</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS2 Manage third-party service</td>
<td>L</td>
<td>P</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>DS3 Manage performance and capacity</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>P</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>DS4 Ensure continuous service</td>
<td>M</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>DS5 Ensure system security</td>
<td>H</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS6 Identify and allocate costs</td>
<td>L</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS7 Educate and train users</td>
<td>L</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>DS8 Manage service desk and incidents</td>
<td>L</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>DS9 Manage the configuration</td>
<td>M</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS10 Manage problems</td>
<td>M</td>
<td>P</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS11 Manage data</td>
<td>H</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS12 Manage the physical environment</td>
<td>L</td>
<td>S</td>
<td>P</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>DS13 Manage operations</td>
<td>L</td>
<td>P</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Monitor and Evaluate**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Importance</th>
<th>Strategic Alignment</th>
<th>Value Delivery</th>
<th>Resource Management</th>
<th>Risk Management</th>
<th>Performance Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME1 Monitor and evaluate IT performance</td>
<td>H</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>ME2 Monitor and evaluate internal control</td>
<td>M</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME3 Ensure compliance with external requirements</td>
<td>H</td>
<td>P</td>
<td>P</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ME4 Provide IT governance</td>
<td>H</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

H – high  M – medium  L – low  P – primary  S – secondary  _ marked are important for the research

Table 13: Mapping IT processes to IT governance focus areas (ITGI, 2007)
The definition of the strategy plan was highly relevant and important to the focus area strategic alignment and was of secondary importance to the focus areas of resource management and risk management.

For the development of the questions and further research, only the processes with medium and high importance and primary relationships with a focus area were used. COBIT uses a level scale from 0 → 5 to evaluate the maturity of the processes, but this was not possible for every process in this research. The respondent perhaps did not know the exact maturity of the various processes or gave probably false answers.

For the further theoretical underpinning of this research I used the COBIT 4.1 (ITGI, 2003) because this comprehensive IT governance framework addresses every aspect of IT and integrates all of the main global IT standards (ISACA, 2015). The COBIT is the widely used framework for IT governance.

Willcocks et al. (1997); and Lacity and Willcocks (2001) developed a resource-based approach using the nine core IT capabilities framework to exploit IT as a strategic resource. In this research field in IT this also widely used for case studies. I combined Lacity and Willcocks (2001) nine core IT capabilities with the COBIT IT governance cycle and developed a research model for the further research. I sorted the capabilities into the COBIT focus areas of the IT governance cycle. If an interviewed organisation had high levels in these core IT capabilities I could evaluate the effectiveness of the IT in the COBIT focus area. Using this research model and the questionnaire I developed a robust and practical research framework to collect the required information for further research. After the data collection and data analysis I proved whether my categorisation of the core IT capabilities was correct.
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**IT governance/ leadership**

Lacity and Willcocks (2001) defined that effective IT management sets goals and directions in various areas and devises organisational arrangements of processes, staffing and structures in order to manage their interdependencies and address challenge areas. The IT management establishes strong IT relationships in business at the executive level and increases these relationships to attain a shared vision of IT. The IT managers determine the values and culture of IT visions and manifest that IT should contribute to the business (Lacity and Willcocks, 2001).

**Business systems thinking**

Lacity and Willcocks (2001) said that business processes should improve under the light of technological potential. Business system thinking merges world business strategies and technological applications. The top management knows IT business requirements exactly. Willcocks et al. (1997) defined this briefly as envisioning the business process which technology makes possible. The business systems thinking capability is part of the COBIT focus areas of strategic alignment, risk management and performance management.

**Relationship building (communication)**

Communication in large companies is very important for its efficiency. Willcocks and Lacity (2001) defined this as wider dialogue between business and IT communities. Relationship building improves the teamwork between technicians and others in the organisations. Both sides have to aim to understand each other.
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Architecture planning
Lacity and Willcocks (2001) said that designing technical architecture or IT strategy was the main task of the technical face. The IT architects use their insight into technology business directions and suppliers to assist organisations to continuously optimise without resource sapping migration efforts. The planner designs the infrastructure from the organisation’s business strategy and IT strategy considering of the core business, technical and economical possibilities.

Making technology work
Lacity and Willcocks (2001) defined that the capability of making technology works as the operation in the overlap between challenges of IT architecture design and delivery. IT managers require a deep knowledge of IT architecture planning to work out pragmatic short-term solutions. The IT managers have to rapidly troubleshoot a problem across the technical supply chain as well as identify business needs and develop suitable solutions (Lacity and Willcocks, 2001).

Informed buying
Lacity and Willcocks (2001) stated that the capability of informed buying involves the analysis of the external market for suitable services or products and the selection of sourcing strategy to average technology and IT services with business needs. Furthermore the managers have to manage tendering; as well as contracting and developing the services. Companies that retain 80% or more of their IT services in-house need informed buying and discover two trends (Lacity and Willcocks, 2001). First, IT managers need reassurance that the in-house option is truly comparable with external services. Second, where core IT architecture or other operations services are centralised in-house the IT-managers define internal services with service level agreements.
Contract facilitation
Lacity and Willcocks (2001) said that contract facilitation operates in the areas of supply services or products and core business. In large organisations in a long-term relationship it is important to resolve problems and conflicts promptly. Large organisations have a lot of service providers and suppliers. Therefore, strict roles and good coordination are necessary to manage user demands and avoid cost overruns with the suppliers and service providers. IT is necessary to have contracts and service level agreements for internal IT services.

Contract monitoring
Lacity and Willcocks (2001) said that the contract monitoring is a core IT capability to protect the business position. Contract monitoring forces the supplier to meet the service level agreements and develops performance standards for the service market. Organisations can develop a report card to benchmark each provider’s achievements and compared them with the standards in the service contracts (Lacity and Willcocks, 2001).

Vendor development
Lacity and Willcocks (2001) defined that the vendor development is defined as identifying the potential added value of IT suppliers and providers. The main aim of IT outsourcing is to minimise costs. Companies should use vendor development to look beyond existing service contracts and discover long-term supplier potential. The supplier increases his profits by providing services and the customer improves his core business benefits (Lacity and Willcocks, 2001). The contract must be a win-win situation for both customer and supplier.
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Staff and knowledge development
Lacity and Willcocks (2001) stated that seven out of nine capabilities rely on interpersonal skills for success. They also said that high business skill influences the capabilities of IT governance, business system thinking, informed buying and vendor development. Strong capabilities in business IT relationship building, designing technical architecture and making technology work are vital to technical success. This information from the table of capabilities and skills in the emerging IT function show the importance of skills (Lacity and Willcocks, 2001). In contrast to Lacity and Willcocks, I thought that staff development and knowledge development was an important capability. Both authors defined this separately from framework as the category skills. My argumentation was employees in an organisation or company have special skills due to their knowledge, education and experience and this all belongs to staff development and knowledge management.

Project management
Lacity and Willcocks (2001) said that in dynamic business environments there has been a shift of emphasis from hierarchical, functionally based organisations to task and project-based operations. This means that project management skills will spread throughout task and project-based operating organisations. In relation to IT, it does not matter what the IT component in a project is. A project manager can come from any business field. The most important benchmark is credibility, which reflects proven success when it comes to managing projects. In contrast to Lacity and Willcocks, I thought that project management was an important capability. Both authors defined this separately from framework as the category skills.

In the following diagram I sorted the core IT capabilities into the COBIT focus areas. This is the research model with the core IT capabilities to exploit IT in the COBIT IT governance cycle.
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Figure 23: Research model with the core IT capabilities to exploit IT in the COBIT IT governance cycle
3.5. Interview questions concerning COBIT focus areas

Strategic alignment
According to COBIT 4.1 (ITGI, 2007), strategic alignment processes include the definition of strategy plans, communications of aims and strategy as well as the management of quality, IT risks and projects. These processes were the bases of some questions regarding the focus area strategic alignment.

Value Delivery
The questions regarding the focus area value delivery involved the management of IT investment, quality of service, changes, solutions, problems, data and configuration. The definition of service levels and the process of internal control are also important (ITGI, 2007).

Resource management
The ITGI, (2007) defined that resource management comprises the determination of technological direction, the management of IT human resources, the procurement of IT resources, the definition and management of service levels and the data and configuration management. These processes were the bases of some questions regarding resource management.

Risk Management
The ITGI, (2007) defined that the risk management involves IT processes in the COBIT domain of “plan and organise”, as well as communication of management aims and directions, and the assessment and management of IT risks. In the domain “deliver and support” I integrated questions concerning service quality, system security and data management. The questions regarding the domain “monitor and evaluate” are important to the risk management. These processes include monitoring and evaluating internal control, compliance with external requirements and providing IT governance (ITGI, 2007).
Performance Measurement

According to COBIT 4.1 (ITGI, 2007), the focus area performance measurement identifies three primary processes of high and medium importance. I derived interview questions from the following processes: the process definition and management of service levels in the domain “deliver and support”, and evaluation of IT performance and providing IT governance in the domain “monitor and evaluate”.

<table>
<thead>
<tr>
<th>Questionnaire parts</th>
<th>Sources of the questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic questions</td>
<td>Questions to characterise the company (author, 2012)</td>
</tr>
<tr>
<td>Strategic alignment</td>
<td>Questions adapted from ITGI (2007) and Gaulcke (2010)</td>
</tr>
<tr>
<td>Value delivery</td>
<td>Questions adapted from ITGI (2007) and Gaulcke (2010)</td>
</tr>
<tr>
<td>Risk management</td>
<td>Questions adapted from ITGI (2007) and Gaulcke (2010)</td>
</tr>
<tr>
<td>Resource management</td>
<td>Questions adapted from ITGI (2007) and Gaulcke (2010)</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>Questions adapted from ITGI (2007) and Gaulcke (2010)</td>
</tr>
<tr>
<td>Outsourcing questions</td>
<td>Questions adapted from author (2012) andAccenture (2004)</td>
</tr>
</tbody>
</table>

Table 14: Questionnaire structure

The complete questionnaire is in chapter four.
3.6. Calculation of IT outsourcing benefits

In this research I used a method similar to that Mitteregger (2009). Outsourcing success is influenced by economic, technological and strategic benefits (Grover et al., 1996). I integrated three questions concerning economic benefits, four concerning strategic benefits and five concerning technological benefits. For each outsourcing question respondents could choose, according to Saunders et al. (2002), from five points on the Likert scale. “A Likert-style rating scale allows the respondent to indicate how strongly she or he agrees or disagrees with a statement (Saunders et al., 2002:p.601). The scale ranges from strongly disagree, to disagree, neutral, agree and strongly agree. The respondent had the opportunity to provide neutral answers, which was not possible in a six-point Likert scale. The advantage of the five-point Likert scale is that the respondent will answer all questions without the need to refuse to answer any. In the data analysis the percentage of economic, strategic and technological benefits were calculated. This data was further used to derive the overall outsourcing success.

The following rating scale used the values between -2 and +2. This was necessary to develop diagrams in Microsoft Excel and for later analysis.

(-2) strongly disagree  
(-1) disagree  
(0) neutral  
(+1) agree  
(+2) strongly agree

For example:

IT Outsourcing helps the company to reduce and optimise IT costs.

O Strongly disagree O disagree O neutral O agree O strongly agree

The values of the questions that belong to the same categories were calculated together and divided by the number of questions in the category.
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For example, calculating the economic benefits with values from the three questions would be as follows: \(2+1+0 = 3 \div 3 = 1\)

1. IT Outsourcing helps the company to reduce and optimise IT costs.
   - O Strongly disagree
   - O disagree
   - O neutral
   - O agree
   - \(\times\) strongly agree

2. IT Outsourcing helps the company to improve the control of IT costs.
   - O Strongly disagree
   - O disagree
   - O neutral
   - \(\times\) agree
   - O strongly agree

3. IT Outsourcing improves the flexibility of IT costs in a company.
   - O Strongly disagree
   - O disagree
   - \(\times\) neutral
   - O agree
   - O strongly agree

The economic benefit with an outcome of “1” from the above example meant that according to the scale below, successful economic benefits achieved.

\[\begin{align*}
(+2) & \text{ very successful} \\
(+1) & \text{ successful} \\
0 & \text{ neutral} \\
(-1) & \text{ not successful} \\
(-2) & \text{ not very successful}
\end{align*}\]

The overall IT outsourcing success was determined after all values of the economic, strategic and technical benefits had been calculated together and divided by three. This value was also the same as the above mentioned success scale. I used a concept adapted from Grover et al. (1996) to classify IT outsourcing success in terms of strategic, economic and technical benefits. The weakness was that each group was defined as having the same value, which was necessary to calculate overall IT outsourcing success. The interviews with the organisations have shown that one benefit was more important to them than the other two. However, to compare the results it was necessary to treat all three categories identically. I inserted the results of all twelve outsourcing questions in a spider chart. The results of the overall outsourcing success were inserted in a column chart.
4. Presentation of the cases

4.1. Case study list

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Branch</th>
<th>Time and Date</th>
<th>Place</th>
<th>Name/ Position/ department</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP Hagen</td>
<td>Public service/ NRW police</td>
<td>14:00 – 15:30</td>
<td>Hagen</td>
<td>Chief Inspector S. (IT-manager, SG 31)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May 9. 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP Dortmund</td>
<td>Public service/ NRW police</td>
<td>10:00 – 15:15</td>
<td>Hagen/Dortmund</td>
<td>Chief inspector S. (assistant IT manager of network administration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May 23. 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LZPD</td>
<td>Public service/ NRW police</td>
<td>14:15 – 15:35</td>
<td>Hagen/Duisburg</td>
<td>Mr R. (project manager, network department)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>June 5. 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIK (Ministry of the Interior)</td>
<td>IT strategy department of</td>
<td>14:00 – 15:30</td>
<td>Hagen/Düsseldorf</td>
<td>Police Marshal R. (Head of the IT strategy department for the police in the MIK), Chief Inspector B. (assistant of Police Marshal)</td>
</tr>
<tr>
<td>NRW Police</td>
<td>NRW police</td>
<td>January 13. 2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruhrpumpen</td>
<td>Pump Industry</td>
<td>15:30 – 17:30</td>
<td>Witten</td>
<td>Mr J. (CEO and CIO) and Mr B. (IT manager, network administration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May 15. 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bertelsmann</td>
<td>Media branch</td>
<td>14:45 – 15:40</td>
<td>Hagen/Gutersloh</td>
<td>Dr B. (Senior vice president corporate IT, corporate centre Gutersloh)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>February 26. 2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telekom/ T-Systems</td>
<td>IT and communication branch</td>
<td>14:00 – 15:30</td>
<td>Hagen/Frankfurt</td>
<td>Dr A. (senior IT manager, IT strategy &amp; support, T-Systems/ Telekom IT, T-Systems Headquarters Frankfurt)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>June 20. 2014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 15: information about the interview partners
A list of the companies participated in the interviews for the various cases studies is provided in this chapter. Studies were performed in the police at the four authorities of Dortmund, Hagen, the LZPD and the Ministry of the Interior (MIK). Interviews were conducted with the following four large private companies: Ruhrpumpen, Bertelsmann, Telekom and T-Systems. Data analysis and conclusions of the single cases conclude this chapter. (The names of all interview partners were anonymised for this thesis.)

4.2. Case study structure

The eight different cases were described in the next chapters. The data of the case summaries was obtained from the interviews in the different companies and police authorities. The results of the case studies were integrated into the COBIT IT governance framework. Additionally, the findings from the IT outsourcing questions were used to create two different diagrams about IT outsourcing success for both the company and the public authority. The first diagram illustrates technical, economic and strategic benefits of IT outsourcing, while the second diagram shows the results of the various important IT outsourcing topics.

All data from the interviews is biased due to the different circumstances explained in the previous chapter, demonstrating that the collected information was critically evaluated. It is obvious that the IT manager in the police answered very diplomatically because of fear of trouble with higher departments, while the interviews in the private companies were also influenced by the IT manager wanting to create a positive image of their company or to avoid any problems with the owner or top management. The names of all interview partners in the case studies were anonymised in this thesis. In the following is the case study protocol with the possible questions. During the selection process for suitable companies some IT managers requested to see the questions before deciding to proceed with the interview. In some cases the IT manager also invited additional staff of their IT structure to the interview in order for them to answer the questions pertinent to their particular IT role.
I also asked in the interview whether I could record the interview for my research but all participants refused. It was already difficult enough to find companies which willing to participate in my research so I was not in a position to insist on the recording.

4.3. Interview protocol with possible questions

In the thesis of my DBA study course I conducted a research with the title: Are the IT sourcing strategies and IT governance of large concerns sensible for the NRW police and the topics in which they differ? In the last years the IT of the NRW police has fundamentally changed. The modernisation and centralisation of the IT at the LZPD and IT.NRW has led to an extraordinary IT infrastructure that is comparable with the IT of large modern companies. For the data analysis I used the COBIT focus area model, which is the de-facto standard in this area. It shows the maturity level of the IT strategy and IT governance. Please assist me through an interview, which will be approximately one hour long. I would appreciate your assistance since there are no comparable studies concerning this topic. This thesis has no commercial background. I complete this study course only for professional development. I work as an IT manager in the public service.

Demographic questions

1. In which area and in which position do you work in the company?
2. What is the company’s name and the type of company is it?
3. Which market position does the company have and to which branch does it belong to?
4. How many employees does the company have in Germany and worldwide?
5. How is the company’s IT structure (network technology, number of servers and PCs, number of datacentres)?
6. How many IT employees does the company have?
7. Which systems and software are used in the company?
8. Which parts of the IT have been outsourced and when were they outsourced?
9. Where are any problems due to outsourcing?
10. Are there any outsourcing projects planned or realised in the nearest future?
11. What are the aims and advantages of your outsourcing strategy?
12. What are the key factors of your successful outsourcing?

a) Strategic Alignment

1. Has the management clearly defined and communicated the company’s IT strategy?
2. Are there any guidelines and processes which define the coordination of the IT strategy with the company’s business strategy?
3. How is the company’s IT strategy for one year and for five years?
4. What is the IT sourcing strategy for the next years?
5. Does the company have a clear position for the IT technology (pioneer, early adapter, follower, late follower)?
6. Is the IT architecture able to deliver the maximum business support?
7. Who is responsible for IT strategy decisions?
8. How important is IT for business success?
9. Has the company a Chief Information Officer (CIO) in the management?
10. How important do other business units see the company’s IT?

b) Value Delivery

1. Who decides the internal and external allocation of IT-resources?
2. How were the economic benefits of outsourcing calculated?
3. How satisfied is the management with outsourced IT parts?
4. Is the management satisfied with the IT structure and services?
5. How is the performance and how robust, secure, and user-friendly are the IT systems?
6. How fast, integer and accurate is the delivered information?
7. How often have IT projects failed and IT aims have not been reached?
8. Are the service levels for internal and external IT services clearly defined?
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9. Are the responsibilities for IT processes, IT applications and IT infrastructure of the company clearly defined?
10. How is the IT merged with business requirements?

c) Resource Management
1. How often and how many external IT specialists have been hired?
2. How does the company develop the IT specialist's knowledge?
3. How good is the economic knowledge of the IT specialists?
4. How good is the IT knowledge of the IT specialists?
5. Is the company's IT infrastructure and capacity enough for the current and future business requirements?
6. How often has the IT budget overrun to realise business requirements?
7. How often has the IT project budget been overrun?
8. Is there a process flow diagram for the management of IT resources?
9. How does the purchase of IT resources work?
10. How are the suppliers checked and selected?

d) Risk Management
1. Has the company a risk management framework or a process flow and how do they work?
2. How does the IT risk management estimation functions in your company?
3. Are there any worst case scenarios and emergency plans for the IT and how are these situations trained?
4. Are the internal and external IT specialists regularly trained in data security and IT risk management?
5. How are the IT risks considered by the company's management in their business plans?
6. How are the business aims and strategies considered in the IT risk management?
7. Is the company's management constantly informed about IT costs, changes, risks and projects?
8. Has the company a Chief Information Security Officer CISO and has the company achieved any security certifications?

9. Are the internal and external IT processes clearly defined and documented?

10. How is the relationship between the company and its IT supplier and service providers?

e) Performance Measurement

1. How does the company measure the IT efficiency and the economic efficiency of the IT and the fulfilment of the company’s aims?

2. How is the process flow for permanent IT optimisations?

3. How fast can changes be realised in the companies IT infrastructure?

4. Which methods does the company use to measure the user satisfaction and the quality of IT services?

5. Which service level does the company have for internal IT services?

6. Which service level does the company have for external IT services?

7. How does the company control the quality of IT suppliers and service providers?

8. Is there any benchmarking for the different IT suppliers and service providers?

9. Is the management constantly informed about the internal IT control system?

10. Is the management constantly informed about the current status of the IT?

IT outsourcing questions

1. IT Outsourcing helps the company to reduce and optimise IT costs.
   
   O Strongly disagree  O disagree  O neutral  O agree  O strongly agree

2. IT Outsourcing helps the company to improve the control of IT costs.
   
   O Strongly disagree  O disagree  O neutral  O agree  O strongly agree

3. IT Outsourcing improves the flexibility of IT costs in a company.
   
   O Strongly disagree  O disagree  O neutral  O agree  O strongly agree
4. The company has access to innovative IT know-how through external specialists.
   O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

5. The company keeps the infrastructure and the IT on the state of the art through outsourcing.
   O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

6. The company increased the efficiency, quality and security in outsourced areas.
   O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

7. The company has improved the IT security in the outsourced areas.
   O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

8. The company has reduced the risks of IT projects and the IT with the use of external specialists.
   O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

9. The service providers help the company to implement innovations and changes faster.
   O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

10. With outsourcing the company can now focus on its core business.
    O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

11. With outsourcing the company is more independent from internal staff.
    O Strongly disagree   O disagree   O neutral   O agree   O strongly agree

12. With outsourcing the company is more independent from recruiting and training.
    O Strongly disagree   O disagree   O neutral   O agree   O strongly agree
5. Background information about the IT in the NRW

5.1. Background information about the NRW police

In this chapter background information about the current situation of the state North Rhine-Westphalia (NRW) state police is provided to help external readers to understand the environment of the research field. Most of all the information about the NRW police is from the two official websites “polizei.nrw.de” and “intrapol.polizei.nrw.de”. The head authorities and the Ministry of the Interior provided the data to these website authorities. All of the information on the official websites reflects the official opinion of the Ministry of the Interior. As a researcher, I critically reviewed this information according to the checklist of Saunders et al. (2009) to evaluate the relevance and value of the literature sources.
5.1.2. The current situation in the police

The police are subordinate to the Minister of the Interior and he is politically responsible to the parliament. In North Rhine-Westphalia the police assume their duties in three state office authorities and 47 police area authorities with approximately 42,000 police officers and 8,000 employees. Since the 7th of January 2007 the police in North Rhine-Westphalia have been reorganised in two stages. The Ministry of the Interior takes charge of all police authorities and is supported by the supreme regional authorities (LOB). Furthermore, the supreme regional authorities assume central state duties (Polizei NRW, 2011).

For decades the past the police did not use the opportunity to introduce modern IT technology although it was necessary for efficient police work. There was no real datacentre and the first network with Microsoft Windows NT was established in the year 2000 although most companies already changed to Windows 2000 in that year (steering group police technique, 2007).
The political aim was to modernise and optimise the Police with a shrinking budget every year. Before the year 2000 the police tried to make these changes with their own staff, this meant that police men were trained to develop and administer the IT infrastructure. The slow development progress and the problems in the IT were not solved with the increase of the staff therefore the government decided to expand the own datacentre LZPD and to employ many computer scientists and engineers from universities and the private sector (project board police technique, 2007).

**District police authorities (KPB) and police presidiums (PP):**

The main focus of the police work in North Rhine-Westphalia lay with 47 police authorities. Their purviews coincide mostly with those of the (major) on independent towns and districts. The police authorities consist of 18 police presidiums (PP) in the independent towns and the 29 polices authorities (KPB) in districts. Here beside the administrative duties to be perceived in all KPB the execution duties are divided into the core areas danger defence/ application, criminal activity and traffic accident control. (Polizei NRW, 2011)

**State Office of Education, Training and Personnel Matters (LAFO)**

The duties of the LAFO are described in particular in §13b of the police organisation law (POG). With approx. 1,200 employees it is responsible for the education and advanced training of the police, apart from the education is not perceived by the four universities for public management and that of the district police authorities as education authorities. Besides the LAFO takes charge of district police authorities in all official-juridical and personnel matters. (Polizei NRW, 2011)
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State Office of Criminal Investigations (LKA):
The duties of the LKA arise in particular from §13 POG. It has his seat in Dusseldorf and is a central office for criminal-police duties with nearly 1,000 employees. It supports the Ministry of the Interior in matters of criminal activity fight and the KPB with the preventive fight as well as with the pursuit and clarification of criminal offences. (Intrapol NRW, 2011)

State office of central police services (LZPD):
The duties of the LZPD are summarized in §13a POG. The central location is in Duisburg, the biggest branch office is accommodated in Neuss. In these regional authorities in whom more than 1,000 employees work a huge number of different duties is bundled up. Thus the LZPD supports the Ministry of the Interior in all questions of the danger defence and it nationally co-ordinates forces. Beside these surgically straightened duties it is responsible for the technical equipment of the police and all matters of information technology and communication technology. According to regulations of the Ministry of the Interior its duties include the control and guidance as well as interests of budgetary problems, economic problems and immovable problems are perceived here state-wide for the police of North Rhine-Westphalia. (Intrapol NRW, 2011)

5.1.3. History of IT development in the NRW Police

In the seventies
In the seventies, the police started to create IT departments in the NRW police but this new technology was only introduced to special units such as the police authority for criminal investigation. The hardware and software was bought from the private market and the software was not programmed for the needs of the police. The rest of the police worked with type writing machines. (SG 31 PP Hagen, 2011)
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In the eighties
In the eighties, the situation was similar to the seventies but there were stronger attempts to introduce IT to the police. The development was slow in contrast to the industry. The first small applications for the police were programmed for control centres but there was still no state-wide introduction of information technology. (SG 31 PP Hagen, 2011)

In the nineties
In this decade, the application WUW, which is the short form of Guard and Shift Service, was introduced as an isolated application in all police authorities. Linux servers and Microsoft Windows 3.11 clients in small networks were linked with copper cabling. Terminal clients with a connection to the databases of the local city administration were established in the control centres and so called data stations, which provided electronic data to other departments. Furthermore, all departments of a police authority had at least one PC but the rest worked still with type writing machines. The hardware and software was not standardised and was bought by the local police authorities. They only used Word Perfect on the PCs and sometimes Microsoft Excel but no specific police software existed. As an example, the Hagen police authority, with over 700 employees, had less than 30 PCs and only a few servers. In 1989, an x400 mail system was only introduced for a few users in all police authorities. The strategy at this time was to decentralise administration to local IT personnel. (SG 31 PP Hagen, 2011, Intrapol NRW, 2011)

In 1998, the government realised that the police had missed the development of IT during the seventies and eighties. The result was that all authorities were equipped with current network technology including routers, switches and 2 M-Bit leased lines from the police authorities to the ZPD (central police services) datacentre. The state chose optic fibre cabling in all large and medium locations and only copper for the smaller ones at a time where most of the other private companies only used copper cabling. In addition, the police authorities received money to buy computers so that 70% of all employees had a PC. (SG 31 PP Hagen, 2011, Intrapol NRW, 2011)
From 2000

In the year 2000, all authorities constructed their own Microsoft NT domains and used NT for their clients. As a result, the first uniform software images for PCs were used by the authorities. Furthermore, Microsoft Exchange 5.5 replaced the old x400 mail system and was connected to central mail gateways at the ZPD datacentre. The whole system administration was decentralised by local IT personnel at the police departments. At this time, the authorities programmed their own small police specific applications with Microsoft Access database solutions. As well, the ZPD provided their first large complex software, IGVP, which was able to assist the complete workflow in offence management. The first web applications, for example the personal data investigation program Polas, were introduced. Additionally, the police could use web applications to access data from the local city administrations. (SG 31 PP Hagen, 2011, Intrapol, 2011)

In 2007, the police changed from a decentralised to a centralised IT strategy and the former ZPD was renamed as the more influential LZPD. With the introduction of Microsoft Server 2003 and XP as the client system, the number of servers was reduced in the local police authorities. There was only one large domain and no longer over fifty small ones. At this time, the LZPD started to administrate the domain controllers and the mail servers which were reduced from over 100 to only 28. The local IT personnel now only administrate their part of the domain. (SG 31 PP Hagen, 2011, Intrapol NRW, 2011)

Over 700 applications, which the different police authorities programmed themselves, were replaced by less than twenty state-wide uniform solutions. Furthermore, the state started the project PC Reinvest, which included the exchange of all client hardware after four years and a state-wide uniform police specific software image. The effect of a uniform hardware and software was the reduction of administrative work in the police. Other servers in the police authorities were replaced by interface PCs which were connected to servers in the LZPD datacentre. Today, the LZPD provides software and patches to all servers and clients.
Since 2007, the LZPD datacentre has outsourced administrative work to IT.NRW, for example the hardware monitoring of all servers. In 2011, the data leased line capacity was upgraded from 2 M-Bit to 50 M-Bit in all main locations. Now, nearly all of the 60 applications are web-based and nearly every month a new application is implemented or an old application is modernised. (SG 31 PP Hagen, 2011, Intrapol NRW, 2011)

5.1.4. Description of the current organisational IT infrastructure of the LZPD

Department 1

The LZPD has two large departments which provide IT services for their customers. Department 1 consists of 3 subdivisions and plans, develops and administers user-related software to support the police activities on-site. The employees of Department 1 observe the market for necessary standard products or ready products for the police that are profitable and cost-saving. In this context, the cooperation with the police of other federal states and European neighbouring countries is becoming more important. (Intrapol NRW, 2011)

Department 11

Department 11, with about 70 employees, is in contrast to the other departments the largest. It is responsible for the application and the administration tasks for all central IT applications. Besides the administration of applications, which are already in production, the department researches the market for useful products and introduces them. (Intrapol NRW, 2011)

These new IT procedures are developed and rolled out within the scope of projects by certificated project managers. In coordination with the respective committees at the federal state, and country levels, Department 11 is partly responsible for developing and researching projects. (Intrapol NRW, 2011)
Department 12
Department 12 is responsible for the perception of the duties in the area of central process management, project organisation and project support. These duties are subdivided into the following subject areas: change, requirement and project management with project support, development of IT application architecture, service-level management and IT cataloguing. Here, Department 12 has to cooperate with the Baden-Württemberg state, in the area of Police-Online and with Bavaria and Thuringia, in the area of IGVP. (Intrapol NRW, 2011)

Department 13
Department 13 is the provider of IT applications for the police work. This means that certificate engineers and information scientists in three subjects of Department 13 develop, program, maintain and consult modern software technical solutions for the NRW police. According to the needs of the police users, the development of user-friendly IT applications guarantees more successful and more efficient police work. (Intrapol NRW, 2011)

Department 2
Department 2 consists of 3 subdivisions and is the central service provider for the technical planning and production of IT for the fulfilment of police tasks. This department is also responsible for the datacentre production. (Intrapol NRW, 2011)

Datacentres
The LZPD maintains in both locations Duisburg and Dusseldorf, two security datacentres in which the central servers are pursued for the important IT applications of the NRW police. The LZPD uses high-availability systems from Hewlett Packard and Fujitsu Siemens which make the necessary technical achievements on different operating systems round-the-clock available.
In February 2011, the police’s datacentre in Dusseldorf was closed and according to the state’s IT strategy, integrated in IT.NRW buildings. (Intrapol NRW, 2011)

Department 21
Department 21, with four subdivisions and 54 employees, oversees the duties for the LZPD central IT service centre. The cycles become shorter and shorter in which new information technologies are developed and every new technology also creates new demands. The North Rhine-Westphalia police pursue different applications in their heterogeneous data net. Data is processed which security needs are high according to the security level classification of the BSI (Federal State Security Institute). Different hardware and software components are used to run an error free 24/7 production. (Intrapol NRW, 2011)

Department 21.1 - IT Control Centre
Department 21.1 manages the IT Control Centre which provides solutions 24-hours per day, 365 days per year for problems which cannot be solved in the local police authorities. Furthermore, the IT Control Centre monitors the status of central and decentralised servers and the most important network components in the CN-POL. Incidental cases require an immediate case inquiry and the access to multistage service levels for the quick error removal or the supply of alternative solutions. In addition, the IT control centre has the duty of a main agency in the police for all formal communication with EPOST. (Intrapol NRW, 2011)

Department 21.2 - state production management
A secure and problem free news exchange between the security organs of the states and the country is necessary to provide police duties. Until 1998, the text communication between the different authorities was completed with distant writing systems. In 1998, 16 federal states and the country developed and introduced together the electronic communication system EPOST and adapted their formal communication to the new technology.
The Department 21.2 has the responsibility to process the formal police communication. It works closely with the government of the country and the other federal states of Germany regarding the functional and technical necessary measures for the deployment of EPOST and crypto systems. (Intrapol NRW, 2011)

In North Rhine-Westphalia, the state management (LBL) closely works together with the so-called downstream control centres (NBL) from the local police authorities, LKA, LAFP and the University of the Police (DHPol). The Microsoft Exchange mail system, as a non-formal communication, is used where formal communication ways (EPOST) are not exactly prescribed. Currently, the North Rhine-Westphalia police use several crypto systems admitted by the BSI for the transmission of news, which has been classified according to the classified material instruction. Department 21.2 manages, in coordination with the Federal Criminal Police authority as an operator of the application, the technical and functional maintenance of the systems and users as well as the planning and committee work. (Intrapol NRW, 2011)

**Department 21.3**

Department 21.3, which is responsible for the data management and background applications, has to take preventive measures by which incidents like data crash, data falsification or changes in the IT infrastructure can be repaired in a short time. To guarantee continuous protection and data security, the product Data Protector is used for the central high-availability servers for police applications. Furthermore, the backup tool Legato Networker is used for the decentralised data backup in the police authorities. (Intrapol NRW, 2011)

Department 21.3 manages and documents the whole life cycle of all hard and software components involved in the IT infrastructure, including the continuous development of commercial processes. Moreover, this department is responsible for the organisation of the national and BSI correspondent data carrier disposal including magnetic tapes, hard disks CD/ DVD which contain protection-worth data. In addition to the necessary data backup measures, automated batches are created with the police background applications for data comparisons with databases from other local city administrations. (Intrapol NRW, 2011)
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Department 21.4
Department 21.4 is responsible for the protection from malware on police IT systems and perceives the duties of a computer emergency response team for the police of North Rhine-Westphalia (PolCERT North Rhine-Westphalia). The interior and municipal ministries are responsible for the maintenance of the situation centre. This department also includes the security IT representative of the LZPD. (Intrapol NRW, 2011)

Department 22
In Department 22, all central applications are technically planned and pursued. For economic and operational reasons, Unix-, Linux and Windows systems are used to fulfill the tasks. The production runs within the scope of a service level which is defined by customers classified from "bronze" to "platinum". For a better availability in the higher service-levels, technical and organisational measures were planned, e.g., call readiness. (Intrapol NRW, 2011)

Department 22.1
Department 22.1, which is responsible for the technical coordination of Windows systems, defines national IT standards and strategies for the ErWin (renewal Windows infrastructure) system surrounding and running applications. At the moment, they are developing the new concept for MoWin (modernisation Windows infrastructure). For this purpose they are testing new hardware and software system technologies and producing preliminary and feasibility studies concerning future technologies in the system. On the one hand they develop test scenarios, examinations, judgments and the external decrease ability of developed new hardware components and, on the other hand, they also develop and supply software close to systems to support the production, system security, administration and software development. Alone and in co-operation with external contractors, they develop tools and components for the administration and configuration.
Moreover, they also develop installation tools as well as software distribution. In addition, they are responsible for the procurement and assignment of components for the ErWin and MoWin system surroundings and the development of suitable processes to ITIL (Information Technology Infrastructure Library) for the area „design and plan“. (Intrapol NRW, 2011)

**Department 22.2**

Unix and Linux are names for operating systems which support a complicated server company. The technical services in this system are responsible for the necessary application demands concerning availability, scalability, answer times, processing time and transaction volumes. Unix- and Linux systems are used for over 20 central police applications. In Department 22.2, Linux- and UNIX server systems are developed for central police applications. The employees of this department summarise the technical services required for the applications. At first, they plan and prepare the technical infrastructure to minimise failure situations and their effects and second, to realise the demanded availability goals. They define the technical service concerning processing and answer times, transaction volumes, economic efficiency and resource needs. Furthermore, they check the contractual security of support achievements for manufacturing firms and foreign companies. (Intrapol NRW, 2011)

**Department 22.3**

The main tasks of Department 22.3 are production, administration and maintenance of central IT applications as well as the used server systems for the North Rhine-Westphalia police. The employees of this department collect and manage service requests to support the different police authorities concerning central IT applications inclusive server systems. They tune the systems and check performance monitoring for group relevant systems. Moreover, they analyse system errors and solve hardware and software problems in central IT applications inclusive server systems according to the incident and problem management ITIL. (Intrapol NRW, 2011)
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The IT experts consult and support projects as well as applications. They also educate and train external and internal employees. Furthermore, they maintain the production, update concepts and do developing support for the applications. The certification, packet assembling, quality assurance and coordination as well as the examination of security-technical demands of IT systems are included in their tasks. Department 22.3 administers and supports Windows server applications which use Intranet 2.0. They also manage ErWin system surroundings for levels 1-4 and are responsible for the systems. In addition, they perform the software certification for suspects of the NRW police who are pursued in the domain polizei.nrw.de. They also provide support for Linux-Unix server applications like IGVP and EPOST and mixed server programs such as the offence management program Servus for example. (Intrapol NRW, 2011)

Further information about ErWin
The state project ErWin was one of the main steps in the IT strategy of the NRW police in the last years. In 2007, the project was introduced to create a nationally uniform and integrated system environment which guarantees the necessary efficiency of the police for the future. In the ErWin project 30,000 PCs and 1,300 servers as well as software solutions were summarised into one large domain to support over 52,000 employees of the NRW police in their work. (Intrapol NRW, 2011)

All servers and clients now have uniformed hardware and software which reduces the amount of costs and personnel. The introduction of new components led to numerous process improvements in the departments and with all users. The advantage of one large domain is that registration and access to personal and shared data is possible from every PC in the whole police organisation, regardless of the location. A further advantage of one large domain is a commonly used user list with roles and authorisation structures for the different applications and data structures. The large domain also makes the exchange of data or staff more effective and easier. The security of the net is improved by the central automated software distribution of certified applications. (ErWin project group, 2011, Intrapol NRW, 2011)
Department 23

Department 23 consists of the two subdivisions 23.1 for IT infrastructure - IT Net/ TK arrangements and 23.2 for engineer services for police location and control centres. The duties of Department 23 are to plan and overlook the assigned state budgets and to consider the economic efficiency of these. (Intrapol NRW, 2011)

Department 23.1

Department 23.1 is a service provider for project engineering, planning and supply of communication and information technology for the state of North Rhine-Westphalia police authorities. The employees of Department 23.1 are responsible for the Corporate Network of the police (CN-Pol), passive and active LAN-and components WAN, net security, telecommunication arrangements, IT-services like firewall, VPN and internet access. The Corporate Network of the police is the basis of all police IT applications in North Rhine-Westphalia. Through this high security data net, all IT applications, formal and informal communication, linguistic communication, intranet respectively internet, etc. are transferred. To make sure that the language does not distort, is incomplete or even breaks off, this data is transferred with the highest priority over the net. A security gateway prevents the penetration from outside the CN-Pol just as the infiltration with malware. (Intrapol NRW, 2011)

This hierarchical net is physically organised so that the base is built up redundantly with failure-secure backbones. With these backbones the police authorities are almost completely double linked to provide a high availability of the net. The employees of the LPZD Department 23.1 administrate, maintain and develop constantly this net to future economic and technical demands of the NRW police. (Intrapol NRW, 2011)

Department 23.2

The employees of Department 23.2 are contacts for the police technology in the guard areas, control centres and police authorities. They are responsible for the planning and supply of technical equipment of control centres as well as the equipment for police office buildings in the area of information and communication technology.
The police buildings fulfil special security criteria, this means that the buildings are alarm secured and have video transference arrangements for the building protection, danger alarm arrangements and admission control of door speech arrangements. The control centre technology was standardised for emergency call control centres and for the central operating unities in main guard areas and prisons. The emergency call control centres use eCebius, MVL and a complementary infrastructure which protects them according to the security guidelines. For all rebuilding and new measures, a team of experienced engineers with sound knowledge of police work and technology make sure that planning and supply of technical equipment is carried out for control centres and guard areas by the valid directives. All standards for information and communication technology in buildings used by the police are maintained and updated by Department 23.2. (Intrapol NRW, 2011)

**PC Reinvest**

Department 32 is responsible for the PC Reinvest which has been running since 2007. About 8,000 PCs have been exchanged yearly on company time by a logistics enterprise. For the whole utilisation time, the police have had a service contract with the manufacturer and have avoided any extra service expenses. Thanks to the excellent support of all authorities, the measure has matured PC Re-invest into a harmonious and successful process. (PC Reinvest project group, 2010; Intrapol NRW, 2011)

**Tasks of the IT Coordination Committee (FAKO IT)**

The committee gathers, values and prioritises the police’s technical demands by the introduction of new or the change of available products and solutions for the NRW police. For this purpose, they categorise and assess the plan application. They cooperate in the phases of economic efficiency investigations and the production of the police’s technical demands. Furthermore, they make statements about IT security and legal data protection. At the end of a project they evaluate the training expenditure and make the final technical check of the product. (Intrapol NRW, 2011; Fako IT, 2011)
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5.2. Background Information about IT.NRW

The following information about IT.NRW is from the official website www.it.nrw.de.

5.2.1. IT.NRW as a service provider for the Ministry of Justice

Since December 2001, IT.NRW has been the service provider for the Ministry of Justice and its authorities. The Ministry of Justice’s technical production centre, TBZ, supervises its over 2,000 servers and network components but its operational production is outsourced to IT.NRW. The decentralised IT structure of the Ministry of Justice make special demands which require IT.NRW IT specialists to accurately coordinate their work with the different departments of the justice. In the year 2001, the Ministry of Justice, together with IT.NRW, created a highly available wide bandwidth net which is integrated in the LVN. The justice’s partly decentralised Microsoft infrastructure offers different IT services to the authorities, but e-mail and Internet are transferred through central server systems of IT.NRW. (IT.NRW, 2011)

Behind the operative work in the TBZ datacentre, the employees of IT.NRW develop, administrate and support the central applications of the Justice Ministry. Furthermore, they control the patch respectively the software distribution for clients and servers as well as secure the infrastructure with a central virus protection firewall. IT.NRW supports the results of system monitoring and different test procedures in the everyday work of the Justice’s system administrators. Additionally, the Ministry of Justice use their own trouble ticket system to document and solve incidents and problems. (IT.NRW, 2011)

5.2.2. IT.NRW as an IT vendor for Strassen.NRW

In the year 2001, the road construction administration of Rhineland and Westphalia Lippe merged together with the state road construction company of North Rhine-Westphalia, Strassen.NRW. As a result of this merger, the IT infrastructure of this new state company was outsourced to IT.NRW as a provider of modern IT and sound IT services.
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The provided services include the maintenance, monitoring and administration of active network components, all Windows servers and central IT services such as virus protection, fax and e-mail. After the introduction of an IT project, the trustful cooperation between the employees of IT.NRW and Strassen.NRW starts. Additionally, IT.NRW supports the state company with their IT supplies and provides services for the trouble ticket system of ARS Remedy. (IT.NRW, 2011)

5.2.3. IT.NRW as a vendor for the following state authorities

IT.NRW is the IT service provider for the State Company of Measuring and Standards in NRW with 10 company locations, the Mining Administration with three company locations, the Staffing Archive Rhineland in Brühl and the Castle Administration in Brühl. In contrast to Strassen.NRW, IT.NRW provides complete IT services, including the installation and servicing of server and client operating systems and the access, user administration, user helpdesk support as well as providing net solutions. Before the introduction of projects, the employees of IT.NRW do the installation, programming and administration of active components, email, and database proxy servers. Moreover, they secure the net with firewall, backup and virus protection solutions. (IT.NRW, 2011)

5.2.4. IT infrastructure of IT.NRW

LVN

The state administration net, LVN, is a closed, high secure network (Intranet) infrastructure in which all authorities and facilities of the public administration in North Rhine-Westphalia can transfer their data communication. IT.NRW, as the operator of the LVN, maintains, administers and supports most of the different communication and news services. The LVN provides services for the communication demands of internal and external customers. The LVN security measures, which fulfil the high security demands of the public administration, are complemented with other preventive measures in the different authorities to achieve a stable and secure architecture. (IT.NRW, 2011)
According to the state’s communication guidelines, the LVN is developing and improving all the time. For this purpose, the LVN uses market-customary, standardised net technologies (TCP/IP, OSPF, MPLS etc.) and redundant backbones which are connected to strong leased lines. In each case, the different authorities only have to have need-related connections to the LVN to reach their communication partners and to achieve further services. Along with gateways to the internet, IT.NRW pursues other net crossings to the CN-Pol of the police, the financial administration, as well as to the communication net of the municipal, state and federal public administration authorities, which is called Testa. (IT.NRW, 2011)

**Network technology**

Over the years, IT.NRW has accumulated experience with a large number of products from different hardware manufacturers to provide its customers extensive and competent consulting regarding IT infrastructure and net topology. IT.NRW takes over the customers’ production of the IT infrastructure if it is required and also introduces modernisation measures such as the construction and rebuilding of the components. IT.NRW signed successive achievement contracts with large hardware manufacturers to guarantee internal customers top discounts. The advantage is that authorities can order products through contracts without issuing their own tenders. Furthermore, IT.NRW can also rent line-capacity through this favourable and successful contract. (IT.NRW, 2011)

**LVN Service Centre**

For the various IT applications and IT services, the LVN Service Centre is the central service desk for requests, inquiries, and complaints for all IT.NRW customers. Moreover, they document incidents in the ARS Remedy trouble ticket system, analyse it and give information about the status of the request. The underlying incident or problem is solved by the LVN service centre as quickly as possible or is transmitted to the responsible departments. (IT.NRW, 2011)
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IT Service Centre
The IT Service Centre (ITSC) of IT.NRW offers customers IT services all around the PC workplace including the first level support for standard software applications and providing solutions regarding PC problems. Several general agreements between IT.NRW and large hardware manufacturers, allow PCs, notebooks, monitors, printers as well as other accessories to be ordered. The employees of IT.NRW support the authorities on site as well as by means of modern distant servicing tools over the net. Among the rest, IT.NRW provides this complete IT service for the State Office, the Ministry of Generations, Family and Integration and the Ministry of Economy, Middle Class and Energy. (IT.NRW, 2011)

Applications and developments
IT.NRW develops or procures for its internal customers IT applications for the realisation of varied administrative duties of the most different complexity degrees. On the one hand, standard software applications from the private market are used, while on the other hand, customised programs are developed to guarantee very economic and generally applicable solutions. Regarding the demands and the wishes of the internal customers, IT.NRW provides complete or part solutions from planning, programming and introduction to the takeover of the production. In order to complete these tasks, external personnel resources can be integrated or external partners can be instructed. IT.NRW bought general licences for standard software products and provides sublicenses to other authorities. Additionally, the employees of IT.NRW can install, provide technical support and introduce products. To fulfil modern and future-oriented demands for its customers, IT.NRW cooperates with IT service providers and all large software manufactures by planning, developing and realising its applications. (IT.NRW, 2011)
Network and system management

IT.NRW offers extensive services in the network and system management to different authorities in NRW. These services, which are carried out in accordance with proved or customised standards, include network, system and application management as well as reporting and service views. The main advantage of complex and widely connected IT infrastructures is that the customers can concentrate on IT core tasks if IT.NRW does the monitoring and reporting. (IT.NRW, 2011)

Windows server

Since 1990, IT.NRW has run a Microsoft Windows infrastructure in the datacentre production and in all different authorities of the public administration. IT.NRW provides its internal customers infrastructure servers (e.g. file server and domain controller) with Microsoft operating systems to use its infrastructure services and carries out the administration of these servers. At first, IT.NRW administtrates the central active directory of the main forest of the nrw.de domain and secondly, it is responsible for the administration of infrastructure servers of the LVN net as well as the servers used in the IT.NRW LAN. (IT.NRW, 2011)

The administration and supply enclose the hardware (installation, repair), the operating system (update, security patches), infrastructure services like DNS, WINS and AD as well as other components, e.g., virus protection and backup. Furthermore, the IT experts of IT.NRW provide first and second level support for the state’s infrastructure servers and consult other internal customers regarding all Microsoft related questions. The experts develop, test, introduce or migrate in new Microsoft technologies and work in IT gremmies of the public administration. Moreover, they administrate the system management software from Microsoft including patches and software distribution. In case of problems which the IT specialists cannot solve, they can use the Microsoft premier's support to find a quick solution for the customer. (IT.NRW, 2011)
Application and database server

IT.NRW has one of the biggest and most varied datacentres in the public administration because it has over 400 important application and database servers. Here, more than 50 different, partly heterogeneous professional procedures are used. The variety of use ranges from easy websites up to important e-government applications and complicated ERP systems. Since the year 2000, IT.NRW has been an open source competence centre because the experts developed extensive knowledge in a large number of server based products such as Apache, Tomcat or various Script languages. The production database systems of Oracle, DB2, Microsoft SQL-Server, Informix, and Ingres are supported and in most cases, Sun’s operating system, Solaris, is used. IT.NRW services include, among other things, installation, administration and application optimisation of the databases as well as development of database backup measures and technical administration of database related management software. In addition, test and developing surroundings can also be provided to fulfil the customer demands and wishes. (IT.NRW, 2011)

Terminal services

IT.NRW installed several large Citrix terminal server farms with central web interfaces for the web access for the TESTA and LVN net as well as other infrastructure servers which have efficiency and economic advantages. This technology supplies central applications, such as database servers, which different authorities in North Rhine Westphalia can use together. IT.NRW provides the customers a complete portfolio including development, testing and introduction of terminal solutions. The employees of IT.NRW install, administrate and optimise the used hardware and software as well as providing second- and third-level user support. (IT.NRW, 2011)
Data storage and archiving

IT.NRW archives the customers’ data on digital or analogous media according to the desired demands as processed data. On the one hand, IT.NRW prepares backup data and provides tools for the data recovery; while on the other hand, data is archived as unchanged data which means that the customer has to have tools to recover his information. As a further backup measure, IT.NRW archives digitised documents on hard disks, DVD, CD, or magnetic tapes while it photographs the digital data with the help of a conversion programme on microfiches. The microfiche issue is a physical 1:1 copy of the storage source medium, which could be stored for the construction of other duplicates at IT.NRW. (IT.NRW, 2011)

For long-term backups, IT.NRW duplicates the data backup on storage mediums in different quality steps regarding processing speed and security available to fulfil the customers’ demands. This service allows the use, administration and maintenance of the infrastructure as well as the data backup and recovery to be contained. IT.NRW also takes over the backup of customer servers in arrangements, which also can deviate strongly from the usual backup procedures. If the customer requests an extra copy, another backup can be produced redundantly at a different datacentre location. (IT.NRW, 2011)

Webhosting

IT.NRW offers as a webhosting provider with an efficient infrastructure, a complete service portfolio including domain reservation, maintenance and administration of secure hosting of web offers. At the moment, IT.NRW hosts approximately 90 Intranet websites for 15 authorities. Every month they receive several million questions and hits. Furthermore, IT.NRW is the webhosting provider for more than 200 public administration authorities and for over 900 internet websites. On average, every month, they receive more than 17 million hits and questions. (IT.NRW, 2011)
IT security management

IT.NRW pursues a high security datacentre for all central IT.NRW servers and customer servers. According to common BSI standards, it is equipped with interruption free electricity supply as well as emergency power supply and redundant climate systems. Additionally, net and system components and server and backup technology are spatially separated. The datacentre buildings are alarm secured, have security doors with admission control system and camera supervision. However, a security centre monitors all of the equipment 24 hours a day. Furthermore, according to BSI IT standard procedures, IT.NRW developed a sound emergency precaution plan for the datacentre production. This is supported by the use of modern hardware and software technology in redundant datacentres. Additionally, an emergency precaution team simulates in an irregular order test respectively incidents and the restoration of the infrastructure after an emergency. (IT.NRW, 2011)

IT service management with ITIL

The Information Technology Infrastructure Library (ITIL) is a collection of proven recommendations (best practices) for the optimal development of important processes of an IT service provider (ITIL, 2011). ITIL describes a professional, systematic action for the management of IT services in which the economic fulfilment of the customer standards is a priority. In this area, ITIL became the only comprehensive procedure library and established itself as the worldwide used standard. The use of ITIL standards has led to a higher quality of IT services and customer satisfaction as well as raises the efficiency. The standardisation of IT processes simplifies internal and external communication and common terminology. Furthermore, the problem solution and documentation has become more transparent and faster. For the automated support of service processes, IT.NRW uses the product ARS Remedy from the company BMC and offers it to public administration customers. Besides offering ITIL basic training, IT.NRW works together with other federal states to optimise and homogenise customer and service oriented processes. (IT.NRW, 2011)
6. Case study Hagen Police Presidium

The police authority in Hagen is a Police Presidium (PP). This means that, according to §2 of the central criminal office enactment, it is the central criminal office for the different authorities in South Westphalia. It comprises approximately 450 policemen and 100 employees. The authority is also one of the six locations of the University of Applied Sciences for the police’s Bachelor students (Polizei NRW, 2012). The authority currently has approximately 780 police students (PP Hagen SG 31, 2018). These completely equipped students study and work at the PP Hagen. The local IT department SG 31 has 18 employees who provide supply and IT system administration services for the approximately 450 PCs (PP Hagen SG 31, 2012).

Strategic alignment

The IT manager of the Hagen PP did not have a clear vision of the police’s current IT strategy because he did not know the precise guidelines for the alignment of the IT strategy with the organisation’s strategy. He stated in the interview that there is strategy paper from 2009. The police force, in his opinion, is a late follower with regard the use of technology. He said: “We introduced Windows NT in the year 2000 when other companies had already migrated to Windows 2000. It was the same with Windows XP migration. [...] But the IT architecture is able to support the daily business optimally.” The IT manager further argued that MIK and LZPD are responsible for the IT strategy but there is also always a political influence. The strategy is the centralisation at LZPD and outsourcing to IT.NRW. The police could possibly work without IT because they have only used network PCs for only twelve years, but they are more efficient and faster with a good IT infrastructure. This is also the opinion of all other departments in the organisation. The title CIO is not used in the police but the head of the LZPD has a similar function.
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**Value delivery**

The decision on the use of internal IT resources is taken by the LZPD or MIK and in some cases also by the local IT departments in the different police authorities. The LZPD establishes whether external resources should be used. The IT manager stated during the interview that, in his opinion, economic, strategic and technical potentials of outsourcing are not fulfilled. Management is not satisfied with the outsourced services for his area. He provided the following example: He decided to do the tasks of the PC Reinvest without the help of the service provider because, according to him, the staff of the service provider is in most cases unqualified and unmotivated. “We had to check the work and correct the errors of the provider’s staff. It is faster without them. But for the money the service provider pays his staff you cannot expect a better service quality.”

However, he stated that they are on the whole satisfied with the IT structure and the provided services of the LZPD. The systems are secure and robust but in many cases not very user friendly. Data can be obtained fast and is complete and accurate. Problems, however, such as with their main product IGVP in 2010 take several weeks to be resolved. He pointed out that IT projects very often failed, were not introduced with the planned volume, or were not finished in time and budget. External service levels for service providers were defined but the IT manager said: “We had on New Year’s Eve in 2009 an urgent problem with a one year old Extreme Switch that cost almost Euro 50,000. It was down and the service provider told us they did not have staff to fulfil the service level requirements. We had to force them to assist us. The technician told us in such cases it is easier for the company to pay the penalty than to honour the obligations.”

Internal service levels are also defined for the police but the fulfilment in the different police authorities and the LZPD is not controlled enough. He further argued that for him, the responsibilities for IT processes, applications and IT infrastructure are not entirely clear although he has been working in a leading IT position in this organisation over 15 years. But he said that overall the IT departments knows the business requirements very precisely.
Resource management

The IT manager of the Hagen PP mentioned in the interview that the LZPD very often uses external staff in all IT areas. External staff is used even for tasks performed in former times by his department - for example, although changing an air filter in the Nortel network nodes lasts ten minutes an external specialist who had a journey time to the police authority of more than three hours was sent. The police and the state of NRW have own training centres for many IT areas and therefore internal staff has a good IT knowledge but only weak or average economic knowledge. During the interview he also emphasised that the IT infrastructure is fit for all future needs. He argued: “In some cases due to the lack of budget only small solutions were introduced. [...] The LZPD reduced the number of servers in the different locations but they did not increase the line capacity. More and more network traffic could lead to a collapse of the network. Therefore, we need stronger lines in the future.” The IT budget of the police authorities is fix and in some cases the LZPD receives extra money from the state’s government for urgent projects. In many cases the planned costs for IT projects are higher than calculated and a cheaper solution or one with fewer functions is chosen otherwise projects would fail due to high costs. The IT manager does not know if there is a process diagram or framework for IT resource management. But the supply guidelines for IT resources are defined in the state’s household rules (LHO) and applied to the suppliers’ selection process.
**Risk management**

The police follow the BSI guidelines for risk management and use the GS (basic security) tool for the documentation of IT security. The GS tool is software for the documentation of IT security in a company or organisation. Each police authority has its own Chief Information Security Officer (CISO) who evaluates the IT risks in the units and also develops network and emergency plans. According to the IT manager of the Hagen PP, the worst case scenarios and emergency plans are drilled and optimised regularly. He explained that in the authorities there should be more training lessons: the IT specialists are trained in various IT areas several weeks per year internally and externally, but not enough in risk management and IT security.

Solutions to work without IT in emergency cases were prepared in the business plans. However, the business aims and strategy are not adequately covered in the IT risk management. The IT manager further said that the management is constantly informed about costs, risks and projects in IT. Furthermore, he also pointed out that the documentation of internal and external IT processes using ITIL is still not complete. The police want to achieve the ISO 27001/27002 certification for IT security in the long term but currently only satisfies the first steps. He further emphasised during the interview: “I can speak only for my area. [...] The relationship with our IT service provider is at a minimum level and, in the case of problems, I speak to them directly.”
Performance management

The IT Manager said that a controlling unit generally measures the IT efficiency and controls the fulfilment of the police’s aims. However, he did not know whether a process for permanent IT optimisation has been established because this is a task of the LZPD. He explained that changes in the IT infrastructure can be made very quickly regardless of the size of the police organisation. The IT manager also mentioned that he has no idea of how the quality of service and customer satisfaction could be measured. “I suppose that this could be done with a questionnaire to be filled out by the different departments.” Furthermore, he argued: “There are service levels for external services in the police but the service provider knows that we are the public service. The provider has no fear of the consequences should he not fulfil the service level.” He also added: “We also have internal service levels at the LZPD but they very often let us wait several weeks or months for solutions and they sometimes ignore the fact that we are the internal customer.

In the last few years the LZPD worked in a more customer-oriented manner after many complaints from the police authorities.” Although these internal service levels are managed with the trouble ticket system Remedy but in his authority the ticket handling is not regulated so strictly. He is not aware of a monitoring system that informs management about the IT status but management is regularly informed by the IT managers. He assumes that the LZPD have monitoring system to inform the Ministry of the Interior.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Results of the case study

Strategic alignment
- IT strategy paper from 2009
- late technology follower
- MIK and IT steering group define strategy
- centralisation of IT at LZPD
- IT outsourcing strategy at IT.NRW
- strategy is influenced by current governing party
- IT is very important for the police

Value delivery
- MIK and LZPD decide on the use of internal and external resources
- IT projects often fail
- clear service level internally and for service providers/suppliers
- secure and robust systems
- due to bugs long downtimes of important applications
- problems with providers in the past

Performance measurement
- regular meetings with LZPD/MIK
- service level checks at LZPD/IT.NRW and for providers/suppliers
- internal management meetings at authorities
- no service level monitoring at authorities
- no internal IT control system in authorities

Resource management
- local IT manager has only few possibilities to act
- focus on outsourcing and centralisation to LZPD/IT.NRW
- LHO guidelines for supply
- IT budgets always too small
- clear supplier management process
- staff training centre at LAFP/IT.NRW
- local staff backbone of the police’s IT

Risk management
- CISO in all locations
- clear risk framework
- processes are documented
- emergency plans have to be improved
- good IT security but not state of the art in some areas
- several long downtimes of important applications in the past
- no relationship with suppliers/providers

IT governance cycle of Hagen PP

Figure 25: Summary of the case study at the Hagen Police Presidium
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

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**IT outsourcing success**

The IT manager of the Hagen PP did not see any real overall outsourcing success (0.37) due to the high costs of external resources. In this case the economic advantages of IT outsourcing were not fulfilled (-0.34). In his opinion the police achieve only marginal strategic benefits (0.25) from outsourcing, but this is also influenced strongly by the fact that he is not convinced of outsourcing because he sees a loss of control and influence in his area. He however acknowledges that the external specialists deliver new know-how the police force does not have. Therefore, he thinks that the technical advantages (1.2) are used successfully.

The independence from internal staff and concentration on the core business are especially important for the police. Therefore, the quality of services and IT security and risk management are optimised through outsourcing. External consultants also provide urgently needed new knowledge and technology, keeping the police’s IT structure updated, but the costs are higher than were they to be performed using internal resources and outsourcing does not improve the financial flexibility of IT costs. The IT manager further remarked that the development and introduction of IT projects are sometimes really slow although the LZPD uses external specialists. In his opinion the local IT specialists, who should be continuously trained and skilled, are the police’s backbone. He concluded that outsourcing and centralisation are political decisions and therefore any logical and economic reasons are not considered. Good outsourcing is expensive and more tasks should not be outsourced or centralised. In his over 30 years in the police force the same ideas have been circulated every decade, only to find after some time that the old solution was better and roll everything back to what it was.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Figure 26: IT outsourcing success at the Hagen Police Presidium

<table>
<thead>
<tr>
<th>Economic advantages</th>
<th>Technical advantages</th>
<th>Strategic advantages</th>
<th>Overall outsourcing success</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.34</td>
<td>0.25</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Figure 27: Outsourcing benefits at the Hagen Police Presidium
7. Case study of the Dortmund Police Presidium

The police authority in Dortmund is a Presidium this means that, according to §2 of the central criminal office enactment, it is the central criminal office for the authorities of Hamm, Hochsauerlandkreis, Soest und Unna. In urgent cases, according to §4 of the central criminal office enactment, it is responsible for the authorities of Bochum, Hagen, Hamm, Soest, Unna, Siegen, Hochsauerlandkreis, Olpe, the Ennepe-Ruhr Kreis and the Märkischer Kreis. It is also responsible for the highway patrol in the area of the Arnsberg district government (Polizei NRW, 2012). It has currently 2,198 policemen, 66 civil servants and 225 employees. The authority is also one of the six locations of the University of Applied Sciences for the police’s Bachelor students. At the moment the authority has approximately 350 students. The local IT department SG 31 has several subdivisions with approximately 65 employees providing supply and IT system administration services for the approximately 1,700 PCs. (PP Dortmund SG 31, 2012)

Strategic alignment

During the interview the IT manager of the Dortmund Police Presidium stated that the IT strategy is in the hands of the Ministry of the Interior (MIK). He was not entirely familiar with the IT strategy for the future. There are processes and guidelines for the alignment of the IT strategy with the organisation’s strategy but this is managed by the LZPD and the MIK. There is always a strong political influence. He argued: “I know that there was a strategy paper in 2009 and we had several meetings with other IT managers in the police force where we discussed the IT strategy for the coming years. […] It is clear that the IT will be further centralised in the LZPD and more and more tasks will be outsourced to IT.NRW.” Furthermore, he explained that the police force is always a late technology follower because the organisation will be introducing Windows 7 in 2014 when large private companies already would have migrated to Windows 8."
In his opinion, the IT structure is better positioned now than ten years ago and can now optimally assist the core business. The IT steering committee of the LZPD and the MIK are responsible for IT strategy decisions. The IT manager, in answer to the question about the importance of IT for the organisation’s success, stated that the police could no longer function effectively without IT. However, he added that this depends on the technology and investments. The police force has currently no chief information officer but he stated that the MIK has a similar function. He concluded this section by emphasising that all units in the police force valuate the work of the various IT departments because IT is very important for their daily business.

**Value delivery**

The IT manager said that in some cases the police authorities decide on the use of internal and external IT resources but this depends on the tasks and requirements of the police. In normal circumstances there is a service contract and the police authority could order external resources from the LZPD. The police authorities sometimes have to pay for external services directly and therefore, they alone select their preferred service provider. The authority alone decides on the use of internal resources but the employment of new staff has to be done by the LAFP. He said: “Formerly the authorities were able to decide staff matters more autonomously, but a few years ago this was changed because some authorities misused this power and, for example, too much staff or paid too high salaries.” The IT manager of the Dortmund PP also said that he is no friend of outsourcing and this was merely a political decision. He could not say if economic, strategic and technological advantages and aims were achieved but he is personally satisfied with the IT tasks that have been outsourced to external service providers. The quality of the tasks outsourced to the LZPD and IT.NRW has improved year on year despite initial problems with the response and resolution times of the LZPD in the case of problems a few years ago.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

According to the IT manager of the Dortmund PP, performance and security of IT systems are state of the art but they could be more user-friendly. The systems are protected, redundant and secured by emergency systems and procedures. The IT manager further commented that the quality of the data is high and delivery is fast, secure and effective. He also explained why IT projects failed or were very frequently restarted. “The police have to make a call for offers for every large project and have to choose the cheapest offer. […] More suitable and popular solutions by market leaders are ignored due to higher costs. […] After several months testing the cheapest offer they realise that the solution was incompatible with their needs and then they search for alternatives. They end up paying the higher cost of the new product as well as the costs of the initial solution.

This happened, for example, for the internet security product. The first solution could not handle a large number of users and this was only found out after several months testing.” He also mentioned that service levels with several escalation levels are defined for internal and external services. Issues are documented in a trouble ticket system also used internally, but in some cases not as strict as the LZPD, which sometimes does not adhere to its own service level obligations. Private companies generally respect the service levels defined in the service contracts with the police. Deutsche Telekom, a telecommunication company, is obliged to solve line problems within eight hours, for example. The LZPD benchmarks and monitors the fulfilment of the external service levels. The IT manager stated that responsibilities for IT processes, applications and infrastructure are clearly defined. Nevertheless, he said: “IT knows the business requirements precisely and many things private companies say about the public service are fairy tales. […] We have a good mix of policemen and IT specialists in IT so that the daily requirements are communicated bilaterally and optimised.”
Resource management

The IT manager could not answer the question about the number of external IT specialists. He knew that specialists from software and hardware companies such as Nortel and Microsoft permanently work for the LZPD. He commented that even small tasks that were previously performed by specialists of the LZPD or the police authorities are now performed by external staff, for example the PC reinvestment (PC Reinvest). According to the IT manager, the development of the specialists' IT knowledge is good because the staff spend several weeks at training centres of the LAFP or IT.NRW. Furthermore, he explained the author: "You cannot compare the knowledge of economics of an IT specialist in the public service with one in the private sector because a police authority works differently economically. However, our specialists have a good feeling of economic matters in the public service." He added that though the IT specialists have a wide range of IT knowledge they are not experts in every field. Formerly, the authorities administrated all servers themselves but now these tasks were all outsourced to the LZPD and IT.NRW. Therefore, they lost the depth of IT knowledge in many IT areas, e.g., MS Exchange mail server administration. He also argued that the IT infrastructure and capacity is large enough for all current and future IT requirements. He explained: "These tasks are the responsibility of the LZPD and MIK but I think they did a good job in the past.”

In reply to the question about the budget of IT projects the IT manager said that in many cases IT projects at the LZPD cost more than planned and money is transferred from other areas to close the financial gaps. The police are obliged by European law to call for offers and select the cheapest rather than the best offer. “Internally we cannot overdraw our IT budgets and save money in one year to spend more the next year because the government will reduce our budget by the same amount the following year. Therefore, we save up the money until the end of the year and then we pay it out all at once. [...] The way the public service operates is quite strange for private companies but that is the law.” There is also a process diagram for the management of IT resources but he comments that these tasks are performed by the MIK and the LZPD.
There are also the state’s household guidelines (LHO) describing the supply of IT resources. In most cases successive contracts are drawn up and all authorities have to use them. He commented this fact: “In many cases the price conditions of these contracts were bad. […] For example, the price for a simple printer is between 30-40% higher than that on the free market. […] The only winner is the supplier and the financial basis of the authority is additionally weakened. The supply process is as follows: “The MIK and the LZPD make offers, choose the supplier, ask the authorities what they need and then make a bulk order.” In cases where the authority itself can decide, it selects the supplier based on product or project. This decision is influenced by price, service and experience with the supplier.

**Risk management**

According to the IT manager of the Dortmund PP, the police have a risk evaluation and framework controlled by the CISO in the different authorities. “We use the GS-Tool (tool for the documentation of the IT security) and follow the state’s information security (BSI) guidelines and every few years we have security audits where everything is checked and the results are judged in per cent and published. […] Every authority thus knows the results of all others and the head of each authority pushes his staff to achieve the best ratings.” The police have developed emergency plans and worst case scenarios but in his opinion, they require further training. The internal IT specialists are also not well enough trained in data security and IT risk management. However the MIK and the LZPD have become more aware of these things and consider them in their business plans. The IT manager disagreed that the business strategies and aims should be part of the IT risk management but he supposed that the LZPD and MIK include them. He agreed that management is permanently informed about IT costs, changes, risks and projects but he further explained: “They have a lot of meetings but sometimes I do not know if they understand all the technical facts.”
Internal and external processes are documented but the IT manager said that sometimes the development and changes are faster than the documentation. Every police authority has its own chief information security officer (CISO) introduced several years ago. He described the relationship to suppliers and service providers as the following: “We have service contracts and the providers should deliver. In the case of problems and we report them to the LZPD.”

**Performance measurement**

The IT manager of the Dortmund PP stated that IT efficiency and financials are measured by the LZPD but he was not exactly aware of how the process works. The LZPD uses the ITIL optimisation process but the police force has a handicap due to its size and the large number of locations. The introduction of new projects, e.g., the migration to the Windows 7 operating system in the MOWIN projects lasts several years due to long intensive tests. Furthermore, the trouble ticket system Remedy can deliver statistical data on how fast and effectively problems were solved and new requirements satisfied. But the ticket system says nothing about the real customer satisfaction and the IT manager did not how this could be measured accurately. The police use a multi-level escalating system with the trouble ticket system Remedy. The LZPD monitors these service levels but the different authorities are not so strict. However, the LZPD also monitors the provision and the quality of service of the suppliers and service providers. However, the IT manager of the Dortmund PP did not know how external services are benchmarked. He provided the following example: “In the past we had problems with the service provider responsible for the PC reinvestment and only after many complaints by different authorities did they change the provider. […] The same case happened with some lecturers from private companies at the LAFP and they also changed the training partner.” Nevertheless, he argued the management of the LZPD is regularly informed by the internal control system so they always know the current IT status.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Results of the case study

**Strategic alignment**
- clear IT strategy
- very dependent on IT
- clear centralisation at LZPD
- out-tasking strategy at IT.NRW
- late technology follower
- strong political influence

**Value delivery**
- internal and external IT service levels
- IT projects often fail
- clear IT responsibilities
- LZPD and IT.NRW in competition with each other
- sometimes there are service quality problems at LZPD
- LZPD/ MIK decide on the use of internal and external resources

**Performance measurement**
- regular meetings of IT manager with management
- internal control system for IT at LZPD
- performance and quality benchmarking at LZPD/ IT.NRW
- processes for IT optimisation
- monitoring of internal and external service level agreements
- benchmarking for providers/suppliers

**Risk management**
- clear risk framework
- CISO in all location
- high IT security
- IT processes documented
- emergency plans practised at LZPD
- no relationship with providers/suppliers
- management is always informed about current status of IT

**Resource management**
- guidelines for resource supply
- shrinking IT budget every year
- reducing IT staff in authorities
- staff training centre at LAFP/ IT.NRW
- clear resource management process
- clear process for the use of internal and external staff
- staff in authorities lose IT know-how

**IT governance cycle of the Dortmund PP**

Figure 28: Summary of the case study at the Dortmund Police Presidium

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IT outsourcing success

The IT manager of the Dortmund PP said that outsourcing in the police force is generally successful (0.78) although economic advantages are not fully utilised. But he explained that outsourcing is successful in technical (0.8) and strategic (1.2) areas. Outsourcing in the police does not reduce costs or increases the cost flexibility but it improves the control of the costs. The IT manager added that outsourcing helps to introduce changes faster and minimise internal staff, training and recruitment. The police could then concentrate on the core business. He agreed that outsourcing improves IT security and the quality of service and reduces IT risks.

The IT manager remarked that many projects were successfully implemented by external specialists but this does not keep the police force’s IT state of the art because this is influenced by various factors. Personally, he fears that too much is centralised and outsourced too fast and this could destabilise the police force’s IT. In his opinion local IT specialists are still needed in the authorities. In the past the Ministry of the Interior had already reduced the speed of centralisation and outsourcing due to urgent problems in the police’s IT infrastructure. He further commented that in the past projects had also failed even with the help of external specialists. “Outsourcing is no guarantee for an effective IT business. You cannot outsource your problems and hope that the provider will solve them. This is an illusion.”
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Figure 29: IT outsourcing success at the Dortmund Police Presidium

Figure 30: Outsourcing benefits at the Dortmund Police Presidium
8. Case study of the LZPD

Strategic Alignment

The project manager of the LZPD explained that the police’s IT strategy is clearly defined and communicated. In his opinion there are clear regulations and processes for the coordination of the IT strategy with the organisation strategy. He said: “The current IT strategy is from 2009 and it is valid for five years. The IT strategy is the centralisation of the IT to the LZPD and the application outsourcing to IT.NRW. We have an IT steering group (ISG) according to ITIL which is responsible for the IT strategy”. He further explained that IT.NRW already hosted many application servers of the police and they already migrated one datacentre of the LZPD to IT.NRW.

Further steps in the optimisation of the police’s IT include the reduction of applications in the various authorities and the standardisation of the IT infrastructure. He further stated that the police is a late technological follower because the large network of over 50,000 users does not allow for fast changes. The current IT infrastructure is able to assist the core business, but the network must be modernised for all future requirements. All IT strategy decisions are made by the Ministry of the Interior (MIK). The police have no chief information officer, but the MIK fulfils this function. He further explained that the police could not work any longer without a functioning IT infrastructure because IT is very important to modern police work.

Value delivery

The project manager said that the MIK makes decisions regarding the use of internal resources. He could not say whether the strategic economics and technological advantages are used: “I know from my project work that the service providers are expensive and I am sometimes not satisfied with their job. In my opinion, the MIK collects all data and calculates the outsourcing success!”
However, the management is satisfied with the IT structure and the provided services although there is much room for improvement and unsolved problems: “The police’s IT performance has some weaknesses, but we have a high security standard!” The provided data is accurate and fast. He stated that in private business IT projects fail 50% of the time, but in the police context, over 70% of all projects are successfully finished. Sometimes projects are not realised in the planned time, volume or budget (i.e., the introduction of digital police radio).

The police use a multilevel escalation service level system for internal services. The LZPD has also service level agreements with all important service providers and hardware suppliers being defined and controlled by a department at the LZPD. The IT control centre of the LZPD monitors the fulfilment of the different service levels. The responsibilities of IT processes, IT applications and IT infrastructure are clearly defined in the most cases. He further said that in a large infrastructure, there are always optimisation potentials. “The LZPD understands the exact business requirements of the police force even though the police authorities sometimes think we are out of touch with their needs”.

**Risk management**

The project manager explained that the LZPD has risk frameworks and process diagrams, but he is not very familiar with the topic. The police use ITIL for the risk evaluation and documentation. Furthermore, each department calculates the risk of its products or systems and develop emergency plans and worst-case scenarios for the risk evaluation and security audits according to the BSI standards. The emergency plans of the LZPD are regularly trained and optimised. The internal staffs are trained in IT security with training sessions at the training centres of IT.NRW and LAFP. He stated further: “If we hire external specialists to improve our IT security, we choose the right one. We had a lack of security on our website and we hired external specialists from private companies and IT.NRW to help us”.

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The management calculates the IT risks in its business plans. For this purpose, the police have backup data lines, backup systems and service contracts with supplies and service provider. However, business aims and strategies are also part of the IT risk management. “We try to fulfil the service level aims of our production 24 hours a day, 365 days a year. We can guarantee the customer uptimes of our systems of 99.9% and the rest is covered by our backup systems”.

The LZPD and the MIK are constantly informed about IT costs, changes, projects, and risks. Furthermore, every police authority has its own chief information officer controlling and documenting IT documentations, emergency plans and worst-case scenarios. Overall, internal and external IT processes are clearly defined and documented. However, the project manager remarked that the projects development is sometimes faster than documentation. In his opinion, the relationship between the service providers and suppliers is good despite some problems in the past, but he can speak only to his experience.

Resource management

The project manager said that the LZPD always has the assistance of external staff. In many cases, specialists from all large service providers assist the LZPD during projects and daily tasks. Furthermore, many applications and servers are already hosted in datacentres of IT.NRW, but only the MIK has specific statistics about this. He stated in the interview that the knowledge of the IT specialists is honed by on-the-job training and training sessions at the training centres of the LAFP or IT.NRW: “The economic knowledge of the IT specialists differs from their IT tasks. In my position, I achieved economic knowledge due to many IT projects”. He further explained that the knowledge of the IT specialists also depends on their education and position. Many of the IT specialists working in the second level support or project development have final degrees in computer science or engineering.
The IT infrastructure and capacity fulfils currently all requirements. In the future, more and more centralised applications will lead to higher network traffic in the CN-POL (corporate network of the police force), so the police have to increase the bandwidth of the data lines. He explained that the police force has a certain amount of money allocated by the state’s budget. They cannot overdraw the budget, but they can move money from one position or project to another: “We have to reach our aims within the planned budget. I think it is better to have higher flexibility because sometimes you cannot calculate the cost in the projects exactly. There are regulation and process diagrams for the management of IT resources”. He further remarked that the police have to follow the state’s regulations and call for offers. In most cases, they are forced to take the cheapest provider or supplier fulfilling the technical requirements: “We have always to follow the state’s household regulations (LHO). Every private company can plan more flexible and more effective”.

**Performance measurement**

The project manager said that IT efficiency is benchmarked at the LZPD and MIK, but he is unfamiliar with the process. The LZPD has an IT coordination department (FAKO), the IT steering group and a central project group which is responsible for all projects. However, these departments attempt to optimise the IT, but there is no special process for permanent optimisations. “Every year we try to reach the planned aims according to the IT strategy paper”. He further explained that changes in the IT infrastructure are realised in the public service specific speed, but that depends on the kind of changes and the number of servers, pcs or users. According to the project manager, there is currently no process to measure customer satisfaction, but there are first user and information meetings with the various authorities where the LZPD seeks information on wishes, requirements and problems.
The quality of services is benchmarked from a department at the LZPD monitoring the up times, downtimes and response times of systems and applications. The police also use the trouble ticket system Turbatio delivering value data about response times, problem solution times and fulfilment of service levels. There are internal service levels ranging from 1-6 and external service levels for external providers and suppliers. The IT control centre monitors the fulfilment of the service levels.

IT departments of the LZPD make and control the service level agreements. Urgent problems must be reported to the MIK. Furthermore, there are processes and regulations for the quality control of IT service providers and suppliers. Project acceptance may come at the end of the project. Acceptance is contingent on whether the delivered services of a product fulfil the required and the planned requirements and aims.

But there is no concrete benchmarking of IT service providers and suppliers. The management of the LZPD and the MIK are regularly informed about the current status of the IT: “The internal control system monitors or regulates costs, processes, aims and informs the management. For example, urgent information is sent with the state’s email system “e-post” to all authorities.”
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Results of the case study

Strategic alignment
- clear IT strategy valid for 5 years
- very dependent on IT
- clear IT centralisation at LZPD
- outtasking strategy at IT.NRW
- late technology follower
- strong political influence
- IT standardisation and IT optimisation strategy
- MIK and LZPD define IT strategy

Value delivery
- internal and external IT service levels
- IT projects often fail or are relaunched
- clear IT responsibilities
- LZPD and IT.NRW in competition with each other
- sometimes authorities unsatisfied due to service quality problems at LZPD
- LZPD/ MIK decide on the use of internal and external resources

Performance measurement
- regular meetings of LZPD IT managers with LZPD management
- internal control system for IT at LZPD
- performance and quality benchmarking at LZPD/ IT.NRW
- attempts for permanent IT optimisations
- monitoring of internal and external SLAs
- benchmarking for providers/ suppliers
- high information exchange between LZPD/ MIK/ KPBs

Risk management
- clear IT risk framework/ processes documented
- high IT security, CISO in all locations
- 99,9 % uptime of systems/ applications
- several lacks of IT security/ long down-times in the past
- emergency plans practised at LZPD
- good relationship with providers/suppliers
- management is always informed about current status of IT

Resource management
- guidelines for resource supply (LHO)
- shrinking IT budget every year
- focus on reducing IT staff in authorities
- one datacentre migrated to IT.NRW
- staff training centres at LAFP/ IT.NRW
- clear resource management process
- clear processes for the use of internal and external staff
- public tenders for all IT investments

Figure 31: Summary of the case study at the LZPD
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

**IT outsourcing success**

The project manager sees only low economic advantages (0.34) in the outsourcing strategy, but he describes the realisation of strategic (0.75) and technical (0.6) advantages as successful. In conclusion the overall outsourcing success is (0.56). He could not say if the IT costs are reduced or the IT cost flexibility is improved but he said that they have a better control of the IT costs due to outsourcing. According to him, the police have access to provider’s know-how, but this does not keep the police’s IT state of the art. He agreed that outsourcing reduces IT risks, increases IT security and improves the quality of services. The project manager also stated that he does not know whether the police can now concentrate more on the core business due to outsourcing. However, he said that the police are now independent from internal IT staff, recruitment and training. In the past they also could realise innovations and changes faster due to external service providers and suppliers.

![Graph showing IT outsourcing success at the LZPD](image-url)

*Figure 32: IT outsourcing success at the LZPD*
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Figure 33: Outsourcing benefits at the LZPD
9. Case study of the NRW police force

Strategic alignment

Police Marshal R. is the head of in the department of the MIK (Ministry of the Interior) responsible for the IT decisions and strategy of the police force. His assistant is Chief Inspector B.. The IT manager explained that the NRW police force has over 40000 PCs, one datacentre in Duisburg and over 350 IT specialists working at the LZPD. However, the police force has a heterogenic network with a focus on Microsoft Windows 2003 server and standardised XP clients, but they will migrate to newer Microsoft systems in the next year. Since 2009, all new applications are hosted at the datacentres of the state’s IT provider IT.NRW. In the future, all applications should be outsourced to IT.NRW, but the provider does currently not fulfil the high security standards needed by police specific applications. The main part of the police’s IT strategy is to use synergy effects capitalising on the reduction of datacentres in the state’s various organisations.

The IT manager stated: “It is obvious that every organisation in the public administration does not need its own datacentres with the same IT infrastructure. In consequence, the police’s IT strategy is to centralise IT tasks on the LZPD outsource IT tasks to IT.NRW. Clear regulations and aims are the key factors of successful outsourcing in the public service”. The MIK defined the IT strategy paper for the police force in 2009, and it is valid for five years. The police attempt every year to introduce planned projects within the current budget. He further argued that the strategy involved the current main aims standardisation of the IT infrastructures, reduction of decentralised IT applications and consolidation of the police’s IT infrastructure (e.g., reduction of the servers). He stated: “The police authorities always attempt to subvert the MIK’s regulations, but they must follow our instructions”. He said that the police do not fit in the technologic scale “early admirter” or “technological follower”. The police want to reach milestones this means that they try to introduce technology necessary for the business success.
The IT manager and his assistant agreed that the current infrastructure is adequate, but the network must be built up further to fulfil all future requirements, especially with regard to the network bandwidth. All IT strategy decisions are made by the MIK. The IT is very important for the modern police work because all work flows are optimised by the IT infrastructure. Many successes of the police force were only possible due to modern research programs and fast criminal complaint processing. He gave the example of the Cebius systems (program for the police control centres), the IGVP (program for criminal complaint processing) and various satellite applications. The police force does not currently have a CIO (chief information officer), but they are considering integrating such a position into the force. This job is executed by departments in the MIK.

**Value delivery**

The MIK makes decisions with regard to the use of internal and external resources. In some cases the LZPD or the police authorities also make decisions regarding the use of staff resources. The economic, strategic and technical advantages of outsourcing are fully employed. The MIK currently makes no statements about the outsourcing success because this process is in a state of flux and they have no clear opinion. The police force an infrastructure outsourcing. This means that the datacentres with the hardware and applications are outsourced to IT.NRW.

Some important applications could not be moved to IT.NRW because the provider could not provide the high security requirements needed by the police applications. These applications will be transferred if IT. NRW improves the security requirements. The MIK is satisfied with the IT structure and the provided services of the LZPD, but this is also a permanent optimisation process. The IT manager stated that the performance of the IT is adequate, and the systems are secure and robust but the applications could be more user-friendly. “In the past, we had two long downtimes of IGVP that hurt us.”
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
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In contrast to private companies, you could read about the downtimes of our application and lacks of security in the newspapers. The provided data is fast and accurate and the police want to increase the bandwidth to guarantee the network speed in the future”. However, he explained that according to their IT controlling department only 20% of all projects fail or were not introduced with the planned volume, e.g., the MoWin aims (modernisation of the police’s Windows infrastructure) were not reached or there were still problems with the replacement of the DSM application (guard shift management) for the next 1-2 years, e.g..

The Police defined internal and external multilevel service level agreements that are constantly monitored and benchmarked. The responsibilities for IT processes, IT applications and IT infrastructure are clearly defined. The LZPD has the departments FAKO (IT coordination group), which is responsible for the development of the IT infrastructure and the central IT project group which is responsible for coordination and integration of new projects. However, he remarked: “Our IT knows exactly the business requirements of modern police work.”

**Risk management**

There are risk frameworks and process diagrams in the police. They use the IT security product GS tool for the documentation and evaluation of IT risks. In the future they hope to achieve ISO 27001/ 27002 for IT security, but they have fulfilled only the initial steps as of yet. The IT manager explained their emergency plans and worst-case scenarios training in the last 3 years. In these scenarios, they train the backup and the recovery of data and systems. However, the whole process from the beginning of an incident over the hotline call to the solution finding in the various IT departments is constantly optimised. He stated they have no backup datacentre due to high costs even though this would improve the IT security. For troubleshooting in risk management, the police use the trouble ticket system Turbatio. However, they are considering a more suitable replacement because they are not completely satisfied with this product.
They have service contracts with service providers for the third level support, for example, for the Cebius (program for the police control centre) application for Microsoft and Oracle products to guarantee the customer fast and professional problem solutions. Furthermore, the IT specialists of the LZPD are regularly trained in IT security internally and in the training centres of the LAFP and IT.NRW. He further argued that they calculate the IT risks in their business plans improving training, staff development, risk evaluation and development of backup solutions.

The IT manager and his assistant agreed that the MIK is constantly informed about the current status of IT costs, changes, projects and risks. For every project, clear project guides are developed for this purpose. The business aims and strategies are also covered in IT risk management. They pointed out that this is further explained in the part performance measurement. That MIK and each police authority has its own chief security information officer evaluation IT risk, development and training emergency plans. Furthermore, he said that all internal and external processes are clearly defined and documented. However, he remarked the following at the end of this section: “We have no personal relationships to our service providers and suppliers. If they invite us to a lunch we pay for us ourselves because there are laws and rules to avoid corruption and in the case of problems we tell them the service provider directly”.

**Resource management**

IT specialists or external staffs with specialised knowledge are hired for projects. He stated that the knowledge of the IT staff is constantly developed with training sessions at the training centres at the police and IT.NRW. The IT specialists have only average economic knowledge because there is separation of the different tasks and there are special departments with a great deal of economic knowledge. The IT knowledge of the IT staffs is adequate depending on the tasks of the first level support, the second level support and IT project groups.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

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The IT infrastructure and capacity currently fulfils all business requirements, but the line bandwidth must be improved for all future needs. According to the IT manager the police could not overdraw the IT budget for the realisation of the business requirements. There is a fixed budget provided by the state and in urgent cases they can transfer money from one position to another. However, he agreed that this is the same for IT budgets, but there are exceptions where they receive extra money from the state. Furthermore, he said that the police use the process diagram “Model XT” for the management and development of IT resources. His assistant explained that the complex process consists of the following steps: project equipment specification, project functional specification, project order, investment appraisal, budget plans, project realisation, project acceptance and project contributions. For this purpose products such as MS Project are used. The IT manager remarked that they are constantly searching the market and collect information about IT trends and products. They also receive value information from their service providers and suppliers who have experience with how other customers manage their IT.

Performance measurement

The IT manager explained that the police use the procedures KWST and Wi-Fi II-4 for the measurement of the efficiency and the achievement of business aims. But he also said that he does not know how to measure the IT efficiency accurately, and he asked the author how private companies do measure this efficiency. There are also several processes for permanent IT optimisations in the police. Furthermore, the police have several departments at the LZPD for this purpose. They organise first user meetings with internal customers to exchange experience about the application. The results and wishes of these meetings inform further optimisations. The police also use the Wi-Fi II-4 to measure the quality of IT services and customer satisfaction.
The LZPD also collects information about response times and downtimes to guarantee the quality of service. He explained that the LZPD introduced a multilevel escalation system for internal problems that ranges from level 1 to level 6. Level 1 has an escalation time of 1 hour, but this is only used for large downtimes and in this case, a BAO (special organisational structure) is established to solve the problem. Level 2 has an escalation time of 4 hours, but this is only used if parts of the police authority’s IT infrastructure are down. Level 3 has a standard escalation time of 2 days. Level 4, 5 and 6 have escalation times of one week, two weeks and one month, respectively. All problems are managed with the trouble ticket system Turbatio. They are considering a more powerful solution as a replacement delivering more reliable results of quality of service and customers satisfaction. There are service contracts with all large suppliers and providers with various service level agreements, e.g., Avaya should solve switch problems in 24 hours.

The IT manager provided an example for quality measurement of providers and suppliers. After the end of a project there is the final acceptance process. The LZPD determine whether the planned functions were realised and only then the service provider or supplier is paid. But he said there is no structural benchmarking of suppliers and providers. In case of problems they collect everything and inform the provider or supplier. The management is constantly informed by the internal control system. Large problems are directly reported to the MIK by the LZPD. The management is also permanently informed about the current status of the IT. There are clear regulations governing how information is sent to MIK, LZPD and authorities. For example, the separate email system “E-post” is used for this purpose.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

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Results of the case study

**Strategic alignment**
- IT strategy valid for 5 years
- reach strategic milestones
- MIK defines IT strategy
- centralisation of IT at LZPD
- IT out-tasking strategy at IT.NRW
- strong political influence
- functioning IT for modern police work
- IT strategy clearly communicated
- authorities try to subvert MIK’s decisions

**Value delivery**
- MIK decide on the use of internal and external resources
- MIK satisfied with IT/ provided services
- Only 20% of all IT projects fail
- clear service level internally and for service providers/ suppliers
- secure and robust systems
- authorities oft unsatisfied with IT services
- problems with providers in the past

**Performance measurement**
- regular meetings with LZPD/ MIK /KPBs
- service level checks at LZPD/ IT.NRW and for providers/ suppliers
- permanent IT optimisations
- no service level monitoring at authorities
- internal control system
- processes for project acceptance
- benchmarking of IT aims/ efficiency
- high information exchange at MIK/LZPD

**Resource management**
- focus on reducing internal IT staff
- LHO guidelines for supply
- public tenders for all IT investments
- fix budget, slow and inflexible system
- process for management of resources
- shrinking IT budgets always too small
- staff training centre at LAFP/ IT.NRW
- always external IT specialists at LZPD

**Risk management**
- clear risk frameworks
- IT processes are documented
- emergency plans are trained
- good IT security, CISO in all locations
- sometimes lacks of security
- sometimes long downtimes of systems
- attempt to achieve ISO 27001/ 27002
- no relationship with suppliers/providers
- MS Server 2003 and XP clients outdated
- service contracts for important programs

Figure 34: Summary of the case study at the NRW Police

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*IT outsourcing success*

At the beginning of the interview, the IT manager explained that they could not make official statements concerning the outsourcing success because they are still in the centralisation and outsourcing process. Therefore, they lack data evaluating the success of their strategy. He further stated that if a provider is reading the present thesis he will glean too much internal information weakening the police’s bargaining position in business meetings with service providers and suppliers. The IT manager rated all outsourcing questions on the 5-point Likert scale including the neutral option. Therefore, the diagram regarding technical, economic, strategic and overall outsourcing success has only null values. However, in the interview, he explained that the police authorities always attempt to influence and manipulate their regulations to have further advantages.

He explicitly stated that the police authorities are sometimes not satisfied with the provided services. Furthermore, he said that they cannot transfer all servers and applications to IT.NRW because they are unable to fulfil the police’s security standards. This means that the service provider is not able to deliver the required service quality. He also mentioned that there is a competence competition between the LZPD and IT.NRW and they have reduced the outsourcing speed to maintain the stability of the IT infrastructure. According to these statements the author concludes that there is no overall outsourcing success, but, due to the fact that the government forces the centralisation and outsourcing strategy for several years, there should be economic, strategic and technical advantages.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Figure 35: IT outsourcing success at the NRW Police

Figure 36: Outsourcing benefits at the NRW Police
10. Case study Ruhrpumpen

Description of business

The following information has been obtained from the Ruhrpumpen website and from the CEO and CIO Mr J. and his IT manager Mr B. Ruhrpumpen belongs to the Mexican company Corporacion EG, which started in 1979 as a machine shop. Throughout the decades Ruhrpumpen became through acquisitions and green field operations a leading global player in the pump production. (Ruhrpumpen, 2013)

Ruhrpumpen is fully vertically integrated having its own foundries, pump manufacturing plants, service centres and machine shops. All kinds of materials can be produced including ductile iron, grey iron and nearly all steel types with a capacity of 7,000 pounds in the foundries. Ruhrpumpen has its production facility in Witten in Germany and is a leading manufacturer of high quality centrifugal pumps and supplies. The core market is the production of water, oil and gas pumps for the mining and other industries. The quality of the products is to the industry standards such as ANSI, API, Hydraulic Institute and also ISO 9001. (Ruhrpumpen, 2013)
Ruhrpumpen has currently eight manufacturing plants worldwide, strategically located in Witten (Germany), Tulsa and Orlando (USA), Monterey (Mexico), Cairo (Egypt), Buenos Aires (Argentina), Rio de Janeiro (Brazil) and Chennai (India). A further large plant is currently being built in Shanghai (China) (Ruhrpumpen, 2013).

Additionally, 34 sales offices and 14 service centres are strategically located worldwide to satisfy all customer needs. With the approximately 3,800 – 4,000 employees Ruhrpumpen is a fast growing global player with the aim to become the number three in the world market for pumps. The first two places are held by a Chinese and an American company respectively, both having more than 10,000 employees (Ruhrpumpen CEO, 2012). The company has a heterogeneous network with UNIX and Windows servers. The company also has some really old server systems (Windows NT) in production but most with newer operating systems. The IT is focused on the large company locations at Monterey, Witten and Tulsa but the other large locations also have their own IT specialists (Ruhrpumpen, 2013).
The strategy is to concentrate IT in the headquarters in Monterrey due to the low wage costs in Mexico. The departments and IT processes are not ITIL structured which means they have no IT hotline, no first and second level support and problems are not documented in a trouble ticket system. In case of problems the affected user directly calls the IT specialists. All complicated tasks are out-tasked to external service providers. Second level support, e.g., support for the MS Exchange mail server or the various construction software solutions, is also provided by external service providers. The IT departments currently do not operate with the “follow-the-sun” principle because the IT specialists in the different time zones are not solving problems in other locations and time zones. In most cases the processes and competences relevant to the different locations are not clearly defined. Ruhrpumpen has over 40 employees providing supply and IT services for the approximately 1900 PCs. (Ruhrpumpen CEO, 2012).
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
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Strategic management

Mr J., CEO as well as CIO of the German location Ruhrpumpen Witten, said IT costs higher than Euro 2,000 are decided at the headquarters in Mexico. “In Mexico they learn from their errors in most cases but they have become better in the last years.” He argued that the company currently has still no real IT strategy for all locations but wants to centralise the IT in the headquarters in Monterey. He added “We are an international company that operates worldwide, but all decisions are influenced by the Mexican owners.” According to the CEO, the company is very successful in the market of pipeline pumps, which consists of water, oil and gas pumps, but the company structure grows at a slower rate than the business. Due to this IT grows only on demand and the company is therefore a late technology follower.

He described the owner’s wish as the follows: “The owners want to minimise costs in the company, especially in IT. They are the opinion that cost-intensive IT tasks should be carried out by one’s own staff since they have in mind Mexican wage costs. But these costs are not comparable to US and German wages.” He agreed that Ruhrpumpen is very dependent on IT because the construction and sales departments could not work one day without. The IT manager supported this with the following example: “A rat bit through a main data fibre optic cable two years ago, causing the company problems for several days. […] These problems led to delays in the construction of the pumps and the company had to pay penalties for the late product delivery to some customers.”

Value delivery

Although Mr J. is the CEO and CIO of the German location, the internal and external use of IT resources is decided by the Mexican owners. He argued that the strategic and technological aims of outsourcing have been achieved but the company is not satisfied with the high costs of the outsourced services. The Mexican owners therefore want to build up the own IT departments further. This is supported by the fact that they are convinced that their own IT staff is very good.
The IT manager explained: “Company’s IT is not really user-friendly due to old programmes but the systems run robustly all the time. The quality of the data is okay but access to it is too slow.” He agreed in the interview that in the past very often IT projects failed because the company did not have the knowledge or the competences were not clearly defined. “Due to old software solutions which are no longer on the market, we have difficulties to migrate our construction data from the old to the new system. Several projects for this migration already failed.” With regard to questions about service level, the CEO answered that the company has not defined service levels for internal IT. In Germany contracts with the service providers also have no service level definitions. However, the IT manager mentioned that the responsibilities for IT processes, applications and IT infrastructure were not clearly defined in the past. “The three main IT departments in Germany, USA and Mexico are in competition with each other and try to surpass each other in an effort to have the most influence.” Nevertheless, he stated that IT knows the business requirements very well and tries to support the business optimally.

**Risk management**

The CEO described IT security management as follows: “The Mexican management in Monterey does not see the necessity to invest too much money in the company’s IT – especially in IT security. [...] A risk framework is not well developed and risk calculation is only at a low rudimentary level. The worst case scenarios and emergency plans, however, were developed by the local IT administration and completely documented.” He added that they have never practised any IT emergency plans or worst case scenarios. The IT manager explained that their mail server was down for several days and they needed the help of external specialists to bring it back online. In this situation there was also no backup system. The company has since built up backup lines for their locations and stores the data tapes in different secure areas in the company. He argued that in this case he could only speak for the German location, but he supposed that the situation is similar in the other locations, too.
The IT specialists do not have sufficient IT security and risk management training. The company lacks a chief information security officer (CISO) and never considered one but IT risks are factored into their business plans. The management is always informed about the current status of IT. The IT manager further argued: “The IT processes in Germany and the USA are clearly defined and documented but in Mexico they have try to reach the same level. […] On the whole, there is no good team work in IT between the locations. This could cause delays in the case of IT problems.” Furthermore, he described the relationship to suppliers and vendors as fruitful and trustful because they have worked successfully together for several years.

**Resource management**

The CEO said that they need the help of different service providers several times per year. He could only speak for the German location since he is not so familiar with the other locations. He said: “We generally only need external help for complicated tasks because we have our own IT specialists who have been passionate about their job for more than 15 years. “The Ruhrpumpen IT specialists are qualified in all general IT areas and are trained to deliver good quality in their daily IT role and also have a sound knowledge of economics.

Every IT specialist attended training programmes in all important IT areas several weeks per year. He said that the IT resources are constantly stretched to the limit because the company’s business growth is too fast. He explained: “Our new plant in China will get our IT into difficulties. […] At the moment no one knows how we could expand our IT and coordinate it exactly between the more than twenty different company locations. The company acquisitions over the last years have also compounded this problem because we have had to merge the different IT structures together.” Ruhrpumpen’s CEO agreed that very often IT and IT project budgets were too small to cater for all required tasks. In some cases the company has process diagrams for the management of IT resources.
Describing the way the management of IT resources functions, he said: “We are looking at the market, asking for offers and then choosing the best or, in most cases, the cheapest supplier or provider. [...] If this supplier or provider is okay we will again select him in future. In such situations I follow my gut feeling.” He also stated again that everything over Euro 2,000 has to be vetted by the management in Mexico that very often ignores the German choice and searches for a cheaper offer or declines the request.

**Performance measurement**

The CEO said that he evaluates IT efficiency by his gut feeling and his experience in the field and he uses no special method. There is also no process or framework for continuous IT optimisations. He explained: “IT is successful if everything works fine and the IT costs are no higher than half per cent of the turnover. [...] Changes in IT are only made when really necessary. [...] We have many old systems and we use them until they are down.” In some cases change is slow or impossible, such as in the case of the old construction database. The company has not defined any internal service levels and has only established a few for external providers. In his opinion, the current service quality of the providers is okay and there is no necessity to establish any service levels.

Quality control of external suppliers and vendors has not been developed but they are thinking of a benchmark system in the future because the service for the construction software works fine but changes to the system are sometimes too slow. Although the company has no internal control system that informs management, but the CIO commented: “We have an open-door policy and flat hierarchies and we discuss all the time and inform the Mexican management.”
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
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Results of the case study

**Strategic alignment**
- no real IT strategy for all locations
- IT driven by business
- very dependent on IT
- insourcing strategy
- late technology follower
- strong regulation by the Mexican owner

**Value delivery**
- high cost optimisation
- IT projects often fail
- no internal and external service levels
- no clear IT responsibilities
- IT locations are in competition with each other
- owner not satisfied with IT
- advantages of outsourcing not used
- several lacks in IT security in the past

**Performance measurement**
- gut feeling of CEO to measure performance and success of IT
- daily telephone conference calls with the owners
- no internal control system for IT
- no benchmarking for service providers and suppliers
- no IT optimisation process

**Risk management**
- no risk framework
- IT risks part of the company’s strategy
- no CISO/low IT security
- most IT processes are documented
- management knows IT risks and they are not part of their IT strategy
- good relationship with suppliers and providers
- no emergency plans are trained

**Resource management**
- too small IT staff and IT budget
- no process for resource management
- focus on saving money
- externals only in case of problems
- every costs over Euro 2,000 has to be vetted by owner
- no process for supplier and service provider management
- familiar providers are preferred

**IT governance cycle of Ruhrpumpen**

Figure 40: Summary of the case study at Ruhrpumpen
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

IT outsourcing success
According to the CEO, IT outsourcing is not very important for Ruhrpumpen but it tries to take advantage of the benefits. Ruhrpumpen has no economic benefits from outsourcing (-0.34) because of the high costs for the required external know-how. The company however successfully gained technical (0.8) and strategic advantages (1.0) from outsourcing. On the whole, the average of all outsourcing benefits is 0.5 and shows that Ruhrpumpen can use advantages but also could be more successful. In the second diagram it is obvious that Ruhrpumpen has strategical benefits from qualified IT staff and from the fast implementations of changes and innovations. The company also uses external specialists to acquire new know-how, particularly in the field of construction software, IT risk reduction and the increase in quality and performance of the whole IT.
The form of outsourcing could be classified as the out-tasking of difficult and complex IT tasks that could not be completed by the own specialists. According to Ruhrpumpen management less than 15% of IT services are outsourced to external service providers. The CEO believes that outsourcing is expensive and therefore tries to build up IT knowledge internally. He agreed that outsourcing needs a trust relationship with the provider. It is critical for outsourcing success that the provider has the required experience and knowledge. He commented: “We had in the past several service providers who were not able to solve our problems; then we did not have solutions but more costs and problems. Therefore, the company does not plan to outsource more than needed.”
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Figure 41: IT outsourcing success at Ruhrpumpen

Figure 42: Outsourcing benefits at Ruhrpumpen
11. Case study Bertelsmann

Description of the Business

All of the following information about Bertelsmann is from the website www.Bertelsmann.com and Bertelsmann’s annual report (2014). The key figures of Bertelsmann are in the appendix. Bertelsmann is active in around fifty countries worldwide and a global player in the multimedia branch. Its geographic core markets are in Germany, France, Spain, the UK and the United States but Bertelsmann is building up a leading position in growth markets such as Brasil, China and India. Bertelsmann’s five corporate divisions comprise of approximately 600 individual companies, providing a broad scope for planning, implementing and documenting its responsibilities. Bertelsmann's decentralise leadership is focused on a variety of topics depending on competence, local relevance and location. The main objective is to assist optimally its core businesses services and the media. (Bertelsmann, 2013)

Organisational Structure

Bertelsmann SE & Co. KGaA is a Group company and that executes central corporate functions. The internal corporate management and reporting is carried out by Corporate Investments and Corporate Centre. Five independent decentralised business divisions are subordinate to the Corporate Center: the RTL Group with television and -radio production operations; the book publishing group Penguin Random House, the global services provider Arvato Bertelsmann; the international printing group Be Printers and the magazine publisher Gruner + Jahr. Bertelsmann’s remaining operating activities are focused under Corporate Investments, comprising Bertelsmann Asia Investments (BAI), the music rights company BMG; and Bertelsmann Digital Media Investments (BDMI) funds, investing in fast growing start-ups in the key markets in Europe, the US and Asia; University Venture Fund, contributing to innovative educational initiatives; and the traditional Book Club business and Direct Marketing operations. (Bertelsmann, 2013)
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ? 
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**Figure 43:** Company structure of Bertelsmann (Bertelsmann, 2013)

The Corporate Centres are responsible for activities in the areas of information technology, human resources, reporting, accounting, financing, taxes, and legal services. Furthermore, the Corporate Centres supervise the internal control, internal auditing, the Group’s strategic development, management and risk management, as well as optimisation of the Group’s portfolio (Bertelsmann, 2013).

**RTL Group**

The RTL Group, the leading European entertainment network, holds shares in 27 radio stations and 55 television channels as well as content production companies around the world. Its television portfolio consists of RTL channels in Germany and Netherlands, M6 in France, Luxembourg, Belgium, Hungary, Croatia and Antena 3 in Spain. The channels Big RTL Thrill in India and RTL CBS Entertainment HD in Southeast Asia are joint ventures of The RTL group. (Bertelsmann, 2013)
Fremantle Media is a Daughter Company of the RTL Group and one of the largest international television production, licensing and distribution companies outside the US. RTL Group currently holds the leading position in Europe in online video due to the catch-up TV services of its broadcasters, more than 140 YouTube channels and the newly acquired multichannel network of Fremantle Media’s and Broadband TV. The group’s flagship radio station is RTL France, and it also owns or has interests in other stations in Germany Belgium Luxembourg the Netherlands, France and Spain. Bertelsmann holds over 75 % of the RTL Group shares (Bertelsmann, 2013).

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Table 16: RTL key figures (Bertelsmann annual report, 2013)

**Penguin Random House**

Penguin Random House is the world’s largest trade book publisher due to nearly 250 independent brands and imprints on five continents, more than 700 million print, audio and e-books sold annually and 15,000 new titles per year. The company, which employs about 12,000 people globally, was a joint venture of Pearson and Bertelsmann, respectively owning 47% and 53%. Penguin Random House is a pioneer in digital publishing, and publishes non-fiction print editions as well as children and adults fiction. Its book brands include imprints such as the international imprint DK; Viking, Alfred A. Knopf, Ebury and Doubleday in the United States; Sudamericana in Argentina; Janés & Plaza in Spain; and Jonathan Cape and Hamish Hamilton in the UK. Bertelsmann itself manages the German-language Verlagsgruppe Random House in Munich, which has publishers such as Goldmann and Heyne. (Bertelsmann, 2013)
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

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<tbody>
<tr>
<td>Revenues</td>
<td>2,655</td>
<td>2,142</td>
<td>1,749</td>
<td>1,828</td>
<td>1,723</td>
</tr>
<tr>
<td>Operating EBIT</td>
<td>309</td>
<td>325</td>
<td>185</td>
<td>173</td>
<td>137</td>
</tr>
<tr>
<td>Employees</td>
<td>11,838</td>
<td>5,712</td>
<td>5,343</td>
<td>5,264</td>
<td>5,432</td>
</tr>
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</table>

Table 17: Penguin Random House key figures (Bertelsmann annual report, 2013)

**Gruner + Jahr**

The Gruner + Jahr (G+J) printing and publishing house has more than 500 media activities, digital offerings and magazines in over thirty countries. Gruner + Jahr publishes magazines such as “Geo” (Germany, Spain and France), “Stern” (Germany), “Eltern” (China, Germany and Spain), “Capital” (Germany and France), “Gala” (Germany and France), and “National Geographic” (Germany, France and the Netherlands). Furthermore, Gruner + Jahr owns one of the largest offset printers in the United States, the Brown Printing Company. Gruner + Jahr also holds 59.9% of Europe’s largest special interest magazine publishers Motor Presse Stuttgart. Gruner + Jahr is a 100% daughter company of the Bertelsmann Group since 2014, when Bertelsmann bought 25.1% of the shares from the Jahr publishing family. (Bertelsmann, 2013)

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<tbody>
<tr>
<td>Revenues</td>
<td>2,065</td>
<td>2,218</td>
<td>2,287</td>
<td>2,259</td>
<td>2,508</td>
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<tr>
<td>Operating EBIT</td>
<td>146</td>
<td>168</td>
<td>233</td>
<td>260</td>
<td>203</td>
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<tr>
<td>Employees</td>
<td>10,819</td>
<td>11,585</td>
<td>11,822</td>
<td>11,637</td>
<td>13,571</td>
</tr>
</tbody>
</table>

Table 18: Gruner + Jahr key figures (Bertelsmann annual report, 2013)

**Arvato**

Arvato is a leading international service provider with more than 66,000 employees active world-wide. Arvato delivers and designs innovative, integrated solutions for business customers, including various business processes across integrated service chains. These service chains cover digital marketing, CRM, SCM and IT services, and financial services. (Bertelsmann, 2013)
Furthermore, Arvato delivers services related to the creation and distribution of digital storage media and printed materials. Arvato is a 100 %subsidiary of the Bertelsmann Group. (Bertelsmann, 2013)

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<tbody>
<tr>
<td>Revenues</td>
<td>4,414</td>
<td>4,419</td>
<td>4,201</td>
<td>5,225</td>
<td>4,826</td>
</tr>
<tr>
<td>Operating EBIT</td>
<td>244</td>
<td>244</td>
<td>269</td>
<td>347</td>
<td>345</td>
</tr>
<tr>
<td>Employees</td>
<td>66,41</td>
<td>63,627</td>
<td>61,257</td>
<td>65,182</td>
<td>60,323</td>
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</tbody>
</table>

Table 19: Arvato key figures (Bertelsmann annual report, 2013)

**Be Printers**

The international printing group Be Printers has approximately 6,200 employees at 18 locations in six countries on three continents and operates gravure and offset printing plants in Germany, Spain, Italy the UK (Prinovis), and Colombia (South America) and in the United States. Be Printers’ production portfolio includes books, brochures, catalogues, magazines, calendars and digital communication services. The group’s corporate centre is in Hamburg. (Bertelsmann, 2013)

<table>
<thead>
<tr>
<th>in € millions</th>
<th>2013</th>
<th>2012</th>
<th>2011</th>
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<tbody>
<tr>
<td>Revenues</td>
<td>1,123</td>
<td>1,214</td>
<td>1,199</td>
</tr>
<tr>
<td>Operating</td>
<td>41</td>
<td>58</td>
<td>72</td>
</tr>
<tr>
<td>Employees</td>
<td>6,201</td>
<td>6,571</td>
<td>7,068</td>
</tr>
</tbody>
</table>

Table 20: Be Printers key figures (Bertelsmann annual report, 2013)

The corporate responsibility of Bertelsmann is based on a strategic but decentralised approach in line with the diversity of its individual companies and businesses, and on the delegation of responsibility. The value of partnership inspired by Bertelsmann Essentials is the basis of the decentralised corporate culture that has been developed over decades. The idea is that local managing directors know the ecological and social environments of their business and are able to make the right decisions to reach their business objectives.
The principle of decentralisation therefore applies to Bertelsmann’s responsibility as well as to its business activities, because business and corporate responsibility are indivisible from each other and therefore, a decentralisation strategy improves responsibility and the business activities. All Bertelsmann companies and divisions evolve their own corporate responsibility activities along their individual value chains and are responsible for implementing the activities. (Bertelsmann, 2013)

![Decentralized Action](image)

**Figure 44:** Bertelsmann guidelines (Bertelsmann, 2013)

**Compliance**

The key elements of Bertelsmann’s value system are social responsibility and appropriate behavior towards employees, customers, public authorities and business partners. Internal regulations on the prevention of legal risks and their consequences and the fulfillment of statutory provisions always have the highest priority at Bertelsmann. In 2008, the Executive Board introduced the Code of Conduct and has permanently evolved and expanded Bertelsmann’s compliance structure and organisation for years. The Code describes binding minimum standards for good governance in the company and raises awareness about possible legal risks. (Bertelsmann, 2013)
The code defines processes for reporting potential compliance violations and submitting ideas for the improvement of compliance-related processes. The Corporate Compliance Committee (CCC) introduces the framework of the company’s compliance organization and monitors the investigation of potential compliance violations. The Executive Board receives annual reports from the CCC with violations and compliance-related developments. Bertelsmann also has an Ethics & Compliance (E&C) department responsible for compliance activities in the company, conducting training sessions, coordinating investigations and reviewing the reports from various whistle-blowing channels. The CCC and the Executive Board report annually to the Supervisory Board. (Bertelsmann, 2013)

Strategy
Bertelsmann is a strong and very profitably operating global player, occupying leading market positions. To reach this objective Bertelsmann builds up optimal conditions that encourages, recompenses and protect creativity. Bertelsmann operates in a wide range of sectors: books, magazines, radio, television, digital businesses and services and is strengthening creativity because all Group’s businesses need entrepreneurial as well as artistic creativity. Bertelsmann, as a global player in the media industry, has leading market positions in its core areas: newspapers, books, television, services and print. Its primary objective is to continuously increase the company’s value through an incessant growth in profitability. (Bertelsmann, 2013)

It has built a fast growing, international and digital group portfolio and invests in existing activities. New business opportunities that complement the established company and offer a wider overall revenue structure are increasingly researched. Bertelsmann only invests in businesses with protectable and stable business models, long-term stable growth, global reach, high scalability and market entry barriers. The main earners of the Group are currently media and services, with education as a third supporting pillar, in the medium term. (Bertelsmann, 2013)
The group strategy devised by the Executive Board in 2013 has four strategic priorities (Bertelsmann, 2013):

1. strengthening core businesses (specifically, investments in creative businesses exploiting and chances for consolidation)
2. developing growth platforms in the divisions (especially, TV production and financial services)
3. increasing the digital transformation of all core businesses (in particular, music rights and education); and
4. expanding in the growth regions Brasil, China and India

Future success is driven by entrepreneurial and content-based creativity; therefore, the Group invests in the creative core of its businesses. For the achievement of these aims, Bertelsmann must have qualified employees at all levels of the Group to guarantee its financial and strategic success. The Executive Board investigates the compliance with and achievement of the strategic development priorities at a divisional level. However, this is also part of the annual Strategic Planning Dialog between the Executive Board and the Supervisory Board. This is also the reason for regular meetings of the Strategy and Business Committee. (Bertelsmann, 2013)

Furthermore, Bertelsmann continuously analyses the competitive environment and relevant markets in order to draw conclusions concerning the appropriate evolution of the Group’s strategy. The Group Management Committee (GMC) supports the Executive Board on topics of corporate strategy and development. This Committee consists of executives representing selected Group-wide functions, key businesses, regions and countries. Bertelsmann uses the value-oriented management system BVA to assess the profitability of operations and return on invested capital. BVA can measure the appropriate return on investment and the realised profit. Bertelsmann’s value orientation influences the management of Group activities, portfolio planning and strategic investments. Qualitative criteria form, together with the value orientation, the basis for quantifying the variable portion of management compensation. (Bertelsmann, 2013)
Corporate governance

German Corporate Governance Code (version dated May 13, 2013) is the basis of Bertelsmann’s guidelines on responsible and sensible corporate governance and management. Bertelsmann’s legal form, Kommanditgesellschaft auf Aktien (KGaA) is a unlisted limited joint-stock partnership. The statutory bodies of the KGaA consist of the supervisory board, the general partner, and the General Meeting. Bertelsmann executive board represents Management SE (general partner), a European stock corporation (Societas Europea). (Bertelsmann, 2013)

However, it is the representative body of the KGaA. Both Bertelsmann SE & Co. KGaA and Bertelsmann Management SE have their own supervisory boards. The supervisory board of Bertelsmann Management SE constitutes and controls the members of the executive board of Bertelsmann Management SE (dual-leadership structure). The management of the business by Bertelsmann Management SE is supervised by the supervisory board of Bertelsmann Management SE & Co. KGaA. The responsibilities and duties of the individual bodies are strictly separated from each other and are clearly defined in each case. The Bertelsmann boards are forced to increase the company value in the long term through sustainable and responsible corporate management, and to secure the continuous optimisation of the company. (Bertelsmann, 2013)

Corporate Management:

Transparent structures and clear decision-making processes

The executive board of Bertelsmann Management SE independently manages the company and determines the strategic direction of the Group, the corporate objectives, management training, Group management and corporate planning and financing. The executive board reports all important information about the financial and earnings position, the strategy implementation and business development, planning, as well as the risk situation and risk management to the supervisory boards in regular meetings.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

The Group Management Committee (GMC), consisting of members of the executive boards and executives of key businesses and regions, consults the executive board on all important matters, e.g., the corporate strategy and development of the group. The supervisory board of Bertelsmann SE & Co. KGaA works closely with and supervises the executive board on important business operations and strategic matters and approves every important measure of the group. (Bertelsmann, 2013)

Bertelsmann Management SE shareholders and the Bertelsmann SE & Co. KGaA elect their respective supervisory board during their general meetings. The supervisory board at Bertelsmann delegates tasks to committees of experts to increase advisory expertise and monitoring efficiency. A work group of management and employee representatives and an audit and finance committee was formed by the supervisory board of Bertelsmann SE & Co. KGaA. The personnel committee is selected by the supervisory board of Bertelsmann Management SE. The personnel committee nominates the nominees for balloting to the supervisory board of Bertelsmann Management SE at the General Meeting. The audit and finance committee monitors and controls the company’s compliance architecture, internal control system, internal auditing system, accounting process and risk management system. The supervisory boards discuss the reports of these committees in their plenary meetings. The work of the committees is constantly audited through several evaluation processes. (Bertelsmann, 2013)

Shareholder Structure

Bertelsmann SE & Co. KGaA is an unlisted limited joint stock partnership consisting of the founding family Mohn and three foundations (BVG-Stiftung, Reinhard Mohn Stiftung and Bertelsmann Stiftung). The Mohn family hold 19.1% and the foundations hold the rest of all Bertelsmann SE & Co. KGaA shares. All voting rights at the annual meeting of shareholders of Bertelsmann Management SE (general partner) and Bertelsmann SE & Co. KGaA are controlled 100% by the Bertelsmann Verwaltungsgesellschaft (BVG). (Bertelsmann, 2013)
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Thesis from Uwe Blind

A steering committee comprising of three representatives of the Mohn family and three external members controls the BVG. The BVG’s objectives are the management of the interests of Bertelsmann’s non-profit foundations and the owning family and the development of the company. In 1835, Carl Bertelsmann founded the publisher Bertelsmann Verlag and the Bertelsmann and Mohn families have since developed the company from an inconsequent medium-sized publishing and printing company into the world’s third largest internationally active media company. The father of this success story is Reinhard Mohn who managed the company from 1947 until 1981. In 1993, he built the current management structure to ensure the continuity of the company’s development and the socio-political, cultural and social commitment of the founding families. For this purpose, he assigned most of his capital shares of the Bertelsmann AG (now Bertelsmann SE & Co. KGaA) to the Bertelsmann Stiftung. (Bertelsmann, 2013)
Demographic information

Dr. B. is the senior vice president of corporate information technology at Bertelsmann and works at the Gutersloh Corporate Centre. He currently has the second highest position in the IT at Bertelsmann. Bertelsmann SE & Co. KGaA is an unlisted limited joint-stock partnership. IT operates in the multimedia sector and is Europe’s largest multimedia company. Bertelsmann has over 38,000 employees in Germany and over 110,000 employees worldwide. The company has several thousand IT specialists and also several thousand people who work in IT-related businesses. Furthermore, Bertelsmann has a network of over 110,000 users, over 50,000 PCs, over 1000 servers and several datacentres and reserve datacentres worldwide (e.g., Gutersloh, New York and Shanghai). (Bertelsmann, 2013)

The company uses the follow-the-sun principle to guarantee service around the clock for its customers. Bertelsmann has a heterogeneous network of Unix and Windows servers and with Windows 7 on the workstation systems. Since the nineties, Bertelsmann outsourced several parts of its IT to outsourcing providers (e.g., administration of the data line and the desktop support). The IT specialists of the service provider work directly in the same locations as the Bertelsmann employees. Dr. Bittner explained that they had some problems with a service provider in India and the sourced everything back to Germany. Larger outsourcing projects are currently not planned because Bertelsmann wants to optimise its IT before starting further outsourcing. The aims and advantages of its current sourcing strategy is full control over IT, which is necessary in the further IT optimisation process. The vice president stated that key factors of their successful sourcing strategy are communication, control over the IT and its highly trained IT specialists. (Bertelsmann, 2013)
**Strategic alignment**

Dr. B. is the senior vice president of corporate information technology at Bertelsmann and he works at the Gutersloh Corporate Centre. He explained that the company’s IT governance has not yet been clearly defined but it is in development. Bertelsmann’s IT strategy is clearly communicated to the whole company and clear guidelines and processes for its alignment of the IT strategy with the company’s business strategy also exists. The board of directors defined the strategy in accordance with Bertelsmann’s internal guidelines. He stated: “In contrast to other companies we have a short-term and a long-term IT strategy for the divisional and cross-divisional IT solutions. Our divisions work like individual companies, with a high decision competence required in order to react quickly to fast changing market situations and customer wishes.” Furthermore, he described the IT strategy for the following years: a focus on the further centralisation of IT, standardisation of hardware and software, the introduction of a central supply, the optimisation of core business support, and the reduction of the number of IT providers and suppliers.

The company also has not yet a clear position with regard to new technology due to the decision between cross-divisional and divisional solutions. Cross-divisional solutions are only introduced company-wide if they are really necessary and a 100% secure and error-free. Due to this the company is a late follower although the divisions are early realiser or pioneers in terms of new technology required to satisfy business objectives and customer demands. He argued: “The IT architecture can optimally support the core business but we always have performance problems if we move quickly into new markets or businesses.” The management of the divisions and the board of directors are responsible for IT strategy decisions but the divisions can decide alone in their own business areas. In the last decade IT has become increasingly important to the company’s commercial success due to rising digitisation in the media industry. The IT vice president further stated that the CIO position is currently vacant but the company is searching for an adequate person.
He further commented that the relevance of IT varies in the different company divisions: it is not so important for the Be Printers division in comparison with the Arvato division since the latter’s IT is a part of its business model. There is also a difference between the company’s internal IT and that needed for services which Bertelsmann provides as a business-process outsourcing provider. Bertelsmann does not use COBIT for the company’s IT governance but they have developed equivalent methods and processes.

**Value delivery**

The IT vice president said that the divisions decide in most cases on the internal and external use of IT resources depending on the business-specific IT structure. But large projects or new business areas require the involvement of the board of directors and the CIO. Furthermore, he remarked: “We tried in the past to exploit the advantages of IT outsourcing but now we know we cannot outsource our problems. Bertelsmann outsourced parts of its IT to India but sourced everything back due to problems with India’s third-largest outsourcing provider, for example. We have to use internal optimisation potential before thinking of outsourcing.”

He explained that Bertelsmann is one of the largest business process outsourcing providers and customers do not accept that their service provider also outsource core parts of its IT business. Therefore, the company does not exploit the strategic, economic, and technical advantages of IT outsourcing, although the management is satisfied with the IT in the outsourced areas, for example, the first-level and desktop support or the data line administration. The IT vice president also remarked that the management sees further optimisation potentials in the IT infrastructure and the internally provided IT services. “The performance of our IT systems is good and the systems are secure, stable and user-friendly but in quickly changing market conditions we always have capacity bottlenecks and process optimisation potential.” He further explained that IT projects sometimes last longer or cannot be completed within the planned budget or objectives.
However, projects are only infrequently rebooted or cancelled, depending on internal and external conditions like the shortage of skilled workers or not yet proven new technology, for example. The provided data is fast, accurate and integer due to continuous investment in the IT infrastructure. Furthermore, Bertelsmann has a department for contract facilitation proofing and defining appropriate service level agreements (SLAs) for IT and IT services. All responsibilities for IT processes, IT applications and the IT infrastructure are clearly defined and certified in accordance with the IT infrastructure library (ITIL). The IT departments in the divisions are quite familiar with the business requirements although there are still optimisation potentials. The internal IT service provider knows exactly the demands and requirements of the different divisions and is able to assist them optimally.

**Resource management**

The IT vice president explained that he is not aware of the number of external IT specialists engaged and the frequency of their use due to the company size and the divisional company structure. The divisions decide on the use of external specialists depending on new projects, solutions or new business requirements. “We have too many service providers and therefore, want to minimise their number.” However, there is no general structure for staff training although Bertelsmann has several training programmes for staff development. Staff is mostly trained internally or visits external, occasionally attending workshops at training providers like Traicen, for example.

Bertelsmann also has a management training programme called Bertelsmann University. IT apprentices are educated at Bertelsmann’s own vocational school, where they can also pursue a dual-study programme and achieve an apprenticeship as an IT specialist and a bachelor degree from the FOM (University of Applied Sciences for Economics and Management) Open University simultaneously. He further explained: “The IT specialists in the different divisions have an excellent economic knowledge because they also calculate the IT costs of the business or new projects. They have a high discretionary competence in their area.”
The IT specialists in the divisions have extensive knowledge, sufficient for all tasks of their daily business. The IT specialists in the datacentres have an in-depth knowledge of their area of specialisation, for example, mailing, networking, firewalls, etc., providing second-level support for other IT specialists in the various divisions of Bertelsmann. The datacentre specialists normally come from a lower economic background. Furthermore, he remarked that although Bertelsmann’s IT infrastructure is sufficient for all current needs, for future business requirements would require that the data lines and system capacity be modernised and extended. The IT infrastructure can be improved with the further centralisation of IT, standardisation of hardware and software and continuous system and process optimisation. He explained further that IT is part of the business model in some divisions, which therefore, have not had a strict IT budget for their business field.

IT costs increase with business development, but in many cases the IT budgets are too small to cater for all future requirements. In many projects the costs are higher than estimated, resulting in cancellation of the projects in same cases. “We expect a specific percentage of profit (in excess of 13-15%) and if this cannot be continuously guaranteed the business model is flawed. Normally over 20% of all new IT projects fail but our IT projects have a better success rate. Bertelsmann does not have a consistent process diagram for the management of IT resources because the divisions paddle their own canoe.” Additionally, Bertelsmann also has not had a persistent centralised supply structure but this will be introduced in the very near future. The strategy is to build a network of a small number of preferred suppliers that are assessed and selected within a reduction model.

**Risk management**

The IT vice president remarked: “Bertelsmann has a risk framework certified to the ISO 27001/ 27002 standard for IT security. This important certification was necessary in order to satisfy all customer demands. Bertelsmann Arvato is one of the largest business-process outsourcing providers worldwide.” The five different Bertelsmann divisions develop their own risk framework and evaluate the IT risks relevant to their own business.
However, Bertelsmann’s internal IT service provider assists the various divisions and evaluates the IT risks of their area, defining a risk framework too. All important IT services and systems emergency plans and worst case scenarios were developed to ISO 27001/ 27002 standard and continuously drilled. He added: "We spend a lot of money for backup lines, backup systems, backup datacentres to guarantee the server response times of 99.99% required to satisfy customer demands." Internal staff is regularly trained in IT security and IT risk management. The management evaluates the transparent IT risks in the business plans. Every minute of system downtime is calculated with all consequences and penalties for not hitting the SLA requirements. Further, the business objectives and strategies are also included in the IT risk management from initial start-up to the end of a business transaction.

The IT vice president explained that the IT costs, changes, projects, and risks are discussed in a weekly status meeting of the Bertelsmann board of directors. "The business optimisation is a continuous discourse between the management and the IT departments. The management wants to maximise profit and the IT departments want to minimise IT risks and improve the IT security and performance generating additional costs." Every division has its own IT chief information security officer (CISO) reporting to the main CISO in the Gutersloh Corporate Centre. All internal and external IT processes are clearly defined and documented in accordance with the ITIL, but sometimes the business is faster than the documentation. He remarked that they do not really have a good relationship with their service providers and suppliers because there are still too many. The strategy is to reduce the number of suppliers and providers and develop a trustful partnership with them.

**Performance measurement**

The IT vice president explained that Bertelsmann measures IT efficiency and IT profitability and the fulfilment of the company’s objectives. “We benchmark our five divisions against other large companies. Our IT reports and our experiences of several years are the basis for the accurate measurement of our results.”
Bertelsmann annually starts a process for continuous IT optimisation, the results of which and potentials for optimisation are discussed by the board of directors. “The company has hundreds of varieties of SLAs for internal or external services ranging from bronze, silver and gold service availabilities or response times, for example. We have own departments for contract facilitation and going further into detail would be beyond the scope of the interview.” He proceeded to describe the support request process: The hotline personnel speak to the internal or external customer and open a ticket in the Remedy trouble ticket system; first-level or second-level support tries to resolve the issue and should no solution be available, the issue is escalated to third-level support at the software and hardware companies.

Bertelsmann is a gold partner of every major IT hardware and software companies, having service contracts with them at various service levels covering from server downtime, response times and penalties for not hitting the required service level. The outcome of the service is documented in IT status reports. A multi-level escalation system important for the quality of service also exists, involving the customer manager of the service provider or supplier in the case of problems. However, Bertelsmann has a flat organisational structure in terms of IT and urgent problems are sent directly to the top management.

Different methods of control for the quality of IT service providers and suppliers are documented in databases, benchmarks and reports. This information is the basis for benchmarking and the regular consulting meetings with the service providers’ and suppliers’ customer managers. The Bertelsmann divisions have a lot of freedom in their decision-making than divisions in other companies and an internal control system keeps management continuously informed. The board of directors is informed about every issue of importance. Bertelsmann also uses the operational Eco-finance programme for this purpose. At this point the IT vice president remarked that he would not go further into detail about the processes as this too would be beyond the scope of the interview.
Results of the case study

Strategic alignment
- short-term and long-term IT strategy
- IT strategy for all units clearly communicated
- IT insourcing strategy with five decentralised independent units
- technological follower in terms of internal cross-divisional IT/ early adapter and pioneer in terms of IT at the divisions
- IT centralisation at internal service provider
- IT out-tasking strategy for less than 10% of IT
- IT part of the business model for all units
- very dependent on IT

Value delivery
- high cost optimisation in all areas
- management satisfied with IT and provided services in the 5 divisions
- management satisfied with IT/ provided services in the outsourced areas
- less than 20% of all IT projects fail
- internal and external service level agreements and contract facilitation
- secure and robust systems
- clear IT responsibilities in all areas
- advantages of IT outsourcing in few areas of the IT infrastructure exploited
- high IT service quality/ good IT infrastructure

Risk management
- good and clear risk frameworks
- IT processes are documented (in accordance with the ITIL)
- emergency plans are regularly drilled
- good IT security, CISO in all locations
- backup lines, - systems and datacentres
- ISO 27001/ 27002 certification for IT security
- no relationship to suppliers and service providers
- Too many service providers and suppliers
- IT risks part of company’s IT strategy
- service contracts with suppliers and providers

Performance measurement
- regular managers/customers meetings
- SLAs benchmarking/ reporting providers/ suppliers
- benchmarking divisions with competitors
- annual IT optimisations process
- fast and effective multi-level escalation system in accordance with the ITIL
- internal control system
- measurement IT efficiency / IT profitability
- Eco-finance program to check aims
- weekly IT meetings of board of directors
- flat organisational structure with a fast information exchange

Resource management
- no clear process for resource management
- focus on cost optimisation
- overrun of IT budget and IT project budget
- good internal education/ training programmes
- reduction model to select suppliers/providers
- many external specialist for new projects
- staff with high economic and technical skills
- training workshops at external partners

IT governance cycle of Bertelsmann

Figure 46: Summary of the case study at Bertelsmann
IT outsourcing success

The IT vice president described the IT outsourcing advantages as following, saying that Bertelsmann is not reducing its costs due to IT outsourcing and that furthermore, he is not sure that Bertelsmann increases its control of and flexibility with IT costs due to outsourcing. Therefore, Bertelsmann is not quite successful in achieving economic advantages (-0.34, see figure 2) of IT outsourcing. He remarked that Bertelsmann is not reducing its IT risk or improving the quality of service in outsourced areas. But they have access to new know-how due to external specialists. He is also unsure whether Bertelsmann can keep the company’s IT state of the art or increase the IT security in the outsourced areas. On the whole Bertelsmann is not quite successful exploiting the technical advantage (-0.2) of IT outsourcing.

Furthermore, The IT vice president explained that Bertelsmann achieves minor strategic advantages (0.25) from its IT outsourcing strategy. He said that they always need external specialists because this makes them more independent of internal IT staff and also increases their independence from the internal training and recruiting of IT specialists. However, Bertelsmann cannot introduce changes and innovations any faster with external help due to the company size and hence inflexibility. In conclusion he commented that Bertelsmann has no real overall outsourcing success (-0.1). Therefore, he repeated, they must first optimise their IT internally before outsourcing. This also explains why they have outsourced less than 10% of their IT.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Figure 47: IT outsourcing success at Bertelsmann

Figure 48: Outsourcing benefits for Bertelsmann
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

12. Case studies Deutsche Telekom and T-Systems

Deutsche Telekom AG

All of the following information about Telekom is from the website www.telekom.com and Telekom’s annual report (2013). The key figures of the Telekom are in the appendix.

Telekom company profile
Telekom is a leading integrated telecommunication joint-stock company with activities in over 50 countries, 228,000 employees, 17 million broadband lines, 30 million fixed-network lines and 151 million mobile customers. Telekom’s revenue in 2014 was 62.7 billion euros. Telekom provides information and communication technology (ICT) solutions to business and corporate customers. It also provides internet, mobile communications, fixed-network/broadband and IPTV services to consumers. This company is undergoing a transformation process; based on its core business of operation and its sales of networks and connections new trends and business areas are being developed. (Telekom, 2014)

Figure 49: Telekom locations worldwide (Telekom, 2014)
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Organisational structure

The group consists of the four operating segments Germany, Europe, United States and Systems Solutions. The financial reporting confirms to the group strategy. The business activities of these segments are assigned in one segment by customers and products and in three segments by region. (Telekom, 2014)

Figure 50: Organisational structure Deutsche Telekom (Telekom, 2014)

The German operating segment supervises all mobile and fixed-network activities in Germany and delivers most of the telecommunications services for all the other parts of Telekom. The European division supervises all mobile operations and fixed-network of the twelve national companies in Albania, Austria, Bulgaria, Croatia, the Czech Republic, Greece, Hungary, Macedonia Montenegro, the Netherlands, Poland, Romania, and Slovakia. In the United Kingdom the Telekom assists in a joint venture. Furthermore, some of the abovementioned national companies also provide ICT Info solutions to business customers. (Telekom, 2014)

The International Carrier Sales & Solutions unit is also part of the European division of Telekom. This unit also provides wholesale telecommunication services to other company parts. T-Mobile U.S. provides all of the mobile activities in the U.S. market. T-Systems brand is the main part of the division Systems Solutions and, as a service provider, supplies all of the ICT solutions and products for large multinational companies and public organisations (www.telekom.com). In a later chapter T-Systems will be described in more detail. (Telekom, 2014)
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Group Headquarters & Shared Services bundles all units that are not part of the divisions, e.g., IT Telekom, and perform cross-segment and strategic management functions. Shared Services unit provides all services that do not fit to the core business activities. Shared Services division is responsible for human resources, financial accounting and operational procurement. This division also includes the Solutions unit (service provider for fleet management and mobility), Vivento (service provider for workforce restructuring), and Real Estate Services. (Telekom, 2014)

Figure 51: Telekom shareholder structure (Telekom annual report, 2014)

**Telekom’s code of conduct**

Telekom’s new group strategy is to fix, transform and innovate. However, Telekom’s code of conduct is a dynamic framework and guide for the behaviour of all employees. A company-wide culture with integrity and also personal and ethical responsibility is becoming increasingly complex and yet important for success. Outside the company this framework fulfils regulations with special requirements and laws in accordance with the five guiding principles. One single incident can damage the company’s reputation and success; therefore a breach of the rules will not be accepted. (Telekom, 2014)
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Telekom’s corporate values

Five guiding principles and a code of conduct are the basis of the Telekom’s internal and external behaviour with the public, and its shareholders and customers.

Deutsche Telekom’s five guiding principles (Telekom, 2014)

1. Customer delight and simplicity drive our action
   The main driver of Telekom’s success is to satisfy every demand of its customer.

2. Respect and integrity guide our behaviour
   Respectful and social etiquette with all partners, customers, suppliers, shareholders and towards the environment and society are important for the Telekom.

3. Team together – Team apart
   An open-minded and tolerant corporate culture is the basis of a good teamwork.

4. Best place to perform and grow
   Telekom is highly regarded by the public due its well trained and motivated employees. Therefore, Telekom promotes individual commitment, professional development and success.

5. I am T – Count on me
   Each employee will, with a high individual commitment, find a solution for all customers’ problems.

Telekom’s compliance

Telekom’s compliance management system is regularly externally audited and consists of the three parts prevent, identify and response. Telekom avoids risks and carries responsibility for the compliance management system; therefore, it has a board of management that supervises compliance, data privacy and legal affairs. (Telekom, 2014)
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Prevent
Telekom want to prevent any misconduct. Therefore, the employees are trained in compliance awareness. There is also a consultation desk “Ask Me!” and Telekom’s code of conduct.

Identify
Telekom has a tip-off portal “Tell me!” for anonymous tips on potential compliance violations. In the case of anonymous tips, specially trained employees investigate the incident with strict confidentiality. There are also regularly detection audits.

Respond
Misconduct is not tolerated and is directly pursued in accordance with the Telekom’s code of conduct and guidelines.

Telekom corporate strategy
Telekom wants to become Europe’s largest service provider for communication (Telekom, 2014).
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**Sustainable development**

Telekom wants responsible corporate governance. Sustainability with social, ecological and economic perspectives is a logical and necessary step for all business activities. The main aim of the Telekom is to create value for the shareholders, to satisfy customer demands and to generate happy employees. The Telekom is the first DAX-30 to fulfil the quota of woman in top management and to use energy from ecological sources. (Telekom, 2014)

**The gigabit society**

The increasing volumes of data need a high speed internet. This development has changed the communication habits of customers both at home and at outdoors; for example, streaming films on PC or smartphone or social networking. (Telekom, 2014)

**A single source**

Customers receive mobile communications, IPTV and fixed network from a single source with Telekom’s guarantee of secure storage and access to all private data from anywhere. In the last five years the Telekom invest over 23 billion euros in its infrastructure in order to build up an intelligent network that can cover the increasing demand of data-line capacity. This is only possible due to the expertise of Telekom’s internal IT service provider T-Systems. (Telekom, 2014)

Telekom has defined four areas in which to reach this goal.

1. **Integrated IP networks**
   
   Telekom offers its customers the best and fastest network and connections independent of the device used. In the next years construction of 150 – 300 Mbit/s LTE with a 85% network coverage is planned. Furthermore, the Telekom will transform the network in Germany and Europe to a fully IP-based network by 2018. (Telekom, 2014)
2. Best customer satisfaction
Telekom wants to provide its customer the best network and service quality. For this purpose the technologies have to be reliable and easy-to-use such as the hybrid router. This router merges the high transmission rate (download speed of 250 Mbit/s) with the consistent, high capacity of a fixed network. Furthermore, Telekom wants that its customers perform themselves as many processes online as possible because this makes the service simpler and faster. (Telekom, 2014).

3. Win-win situation with partners
"We build standardised platforms – imagine a power strip where partners simply plug in their services," said DT CEO Tim Höttges. The strategy is to involve the innovative online services of the partners to improve the Telekom's portfolio of products and services. The basis of this strategy is a simplified network infrastructure, for example, in only three months partners can integrate their products and services with the Telekom’s portfolios such as Evernote and Spotify. Furthermore, partner business platforms are important in particularly in the fields of intelligent networks, payment and smart home, for example, the Qivicon platform for controlling and networking house systems or the development of the e-reader for the bookseller Tolino. Since the market conditions are changing quickly, Telekom has developed a TV platform for Europe for all devices. The goal is to have 10 million TV customers in Europe by 2017. (Telekom, 2014)

4. Leading position in business
Telekom wants to use its leading position in telecommunications to win market shares in the ITC area. The strong position of T-Systems is necessary to develop solutions for virtual collaboration, security solutions, cloud services, fixed-networks and convergent mobile products. (Telekom, 2014)
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**T-Systems**

All of the following information about T-Systems is from the website www.t-systems.com.

**T-Systems company profile**

T-Systems draws on a global infrastructure of datacentres and networks to provide information and communication technology (ICT) systems to public sector institutions and multinational corporations. Telekom offers business and corporate customer integrated solutions for the networked future of business and society. T-Systems’ 47,800 employees in over 20 countries combine industry expertise with IT innovations, thereby adding significant value to its customers’ core businesses all over the world. Furthermore, T-Systems is the largest IT service provider for large companies in Europe. Revenue of around 8.6 billion euros in the 2014 financial year was generated by the corporate customers unit. (T-Systems, 2014)

**Corporate governance**

T-Systems sets high principles in order to meet its business goals. These include compliance, ethical standards and guidelines as well as high expectations. Furthermore, these principles allow T-Systems to direct a successful business. (T-Systems, 2014)

**Sustainable development**

T-Systems is interested in sustainability and environmental protection. As provider of information and technology solutions, T-Systems plays a key role in modern society. This corporation tries to take advantage of this role to encourage and promote environmentalism while finding efficient ways to work that fulfil its imagination regarding sustainability. (T-Systems, 2014)
**Redesign of innovation processes**

T-Systems offers its customers three ways to innovate their businesses and to create actively managed innovations. Offers like that are important for modern businesses because traditional ways of developing ideas and new products lead more and more to dead ends. Therefore, T-Systems has centres such as the Munich Innovation Centre where experts develop new ideas and strategies. (T-Systems, 2014)

**Whistle-blower Portal**

T-Systems has set up its own whistle-blower portal. The purpose of this portal is to allow customers the opportunity to submit their complaints. This provides T-Systems with the chance to solve the complaints. It is the goal to live up to its own high expectations when it comes to its work. If T-Systems knows what it is doing wrong, the corporation will be able to solve the problem. (T-Systems, 2014)

**T-Systems business strategy**

*A market in transformation*

T-Systems operates in a radically transforming market of IT and telecommunications in which business processes are globally and digitally connected. Companies that are not investing in new IT technologies will not survive in the future. Demands are increasing. Customers are increasing their demands for user friendliness, transmission speed, and mobile access. The main changes in the future will be IT services from the cloud, the Internet of Things (solutions for connecting objects), data analytics (applications for analysing large amounts of data in real-time, and machines (M2M, machine-to-machine), which are developing rapidly. (T-Systems, 2014)

The dark side of these developments are the increasing security risks. Hackers are infiltrating the IT systems of an increasing number of companies to gain access to business secrets, customer data, and development results. In the continuous war between hackers and IT security, encryption technologies and security solutions have to be developed and provided to companies as part of the comprehensive support. Therefore, T-Systems is concentrating on three business areas. These are telecommunication, IT and selected digital growth areas. Each is reflected in its organisational structure. (T-Systems, 2015)
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**Business customer brand with a clear profile**
The competition in the ICT market is tenacious due to innovation cycles getting shorter and the growing amount of competitive pressure. As Telekom’s business customer brand, T-Systems is able to maintain high brand recognition as well as fit into the ICT market. As a result T-Systems shows off an individual corporate design while it is undoubtedly linked to the Deutsche Telekom. In a competitive market, T-Systems presents itself as “enabler” as one of Europe’s leading ICT providers. (T-Systems, 2014)

**Three Communications Megatrends**
The three communications megatrends in the global information and communication technology market are the growing number of devices, the growing amount of networking and the growing amount of data shape. Such growing trends increase the importance of information and communication technology. This offers corporations such as T-Systems the opportunity to follow the latest technological trends and become part of a whole new business option. (T-Systems, 2014)

**Five key topics that characterise T-Systems transformation development**
Cloud pioneers such as T-Systems try to respond to the abovementioned trends by focusing on efficiency, customer support, their own technological specialties and the integration of value-added partnerships (T-Systems, 2014).

1. T-Systems confronts difficult market conditions in the classical information and communication technology area with high competition and price pressure, therefore, T-Systems tries to grow in new business fields.
2. T-Systems increases its profitability and the competitiveness of its traditional business by optimising strategies in cost efficiency, processes and radical "make-or-buy" decisions.
3. The driving force for revenue growth is scalable platforms with main focus on networked solutions cyber security and cloud computing.

5. T-Systems assists its customers with their transition from traditional TC and IT services to secure and scalable cloud solutions.

(T-Systems, 2014)

**Business areas of T-Systems**

Figure 53: T-Systems business portfolio (T-Systems, 2014)
Main focus on cloud
T-Systems is a provider of several ICT (information and communication technology) services. As a provider, T-Systems implements, integrates and manages IT solutions for small and medium-sized enterprises as well as large corporations. The benefit of T-Systems being a subsidiary of Deutsche Telekom is that the outsourcing and IT operations are from its own certified, high-security datacentres. Furthermore, its extensive experience as a cloud computing pioneer has earned T-Systems the trust of many acclaimed major corporations including Spain’s national postal service, Shell, and Daimler of Thyssen-Krupp. These corporations rely on the competencies of T-Systems and utilise its network-based applications, computing capacity and storage. (T-Systems, 2014)

Universal network for data, video and voice
T-Systems is a universal network that merges voice, data and video signals with the Internet Protocol (IP) as technical foundation. NGN (next-generation networks) makes it possible, using new business models, for companies to offer their services and applications over the internet. To support companies with issues concerning networks and telecommunications, T-Systems’ main products are IP(internet protocol)-based online services, VOIP (voice over internet protocol) and IPTV (internet protocol television). (T-Systems, 2014)

Principle of swarm intelligence
Social media offers a lot of new ideas and strategies but at the same time it delivers huge amounts of unstructured data. T-Systems uses mass data analytics in order to provide highly scalable, platform-based, standardised products to their customers. These products allow secure storage of unstructured and structured data and also enable rapid analysis. In this way T-Systems is able to deliver the opportunities that social media offers. (T-Systems, 2014)
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Text messaging cows and smart suitcases
T-Systems has integrated practical cloud and M2M solutions into existing ICT structures. This has led to a high-security, high-availability environment that not only involves technical networking, but also links every business process between suppliers and their partners, employees and machines, and companies and their customers. (T-Systems, 2014)

Connected cars and mobile doctors
T-Systems also supports the high potential seen in the automotive and healthcare sectors. Daimler and BMW already use T-Systems’ communication systems for vehicles. These systems enable vehicles to communicate with the help of sensors and smart networking. For the healthcare sector T-Systems uses mobile tablet PC solutions that are called Telemedicine. This allows patients to record their own data, which amongst other effects helps compensate for the shortage of trained medical staff. (T-Systems, 2014)

Cyber warfare
With new technologies such as cloud computing, mobile solutions and data analytics, new challenges have arisen for IT security when it comes to the handling of cyber-attacks. T-Systems, as well as the main corporation Deutsche Telekom try everything to secure the privacy and data security of its own networks, and those of its corporate customers and consumers. T-Systems is constantly developing new security solutions in order to meet the constantly new requirements and to protect privacy. (T-Systems, 2014)
Opportunities of digitisation

T-Systems uses as a subsidiary of Deutsche Telekom, a global infrastructure of datacentres and networks, to operate information and communication technology systems for multinational corporations and public sector institutions. The importance of cloud computing and mobile solutions are changing the information and communication technology sector. T-Systems has separated its operating business into two main sectors. The sales sector is responsible for the business and for the sales-related activities. The other main sector is responsible for the delivery of services, which consists of all the aspects of customer services. This division allows T-Systems to focus on the latest technological trends while big data amounts and social media are stagnating. (T-Systems, 2014)

Demographic information

Dr A. is the lead IT strategist at T-Systems International/Telekom IT and assists the CIO of T-Systems. He works in the T-Systems Headquarters in Frankfurt. Deutsche Telekom, a global player in over fifty countries, is active in the IT and communications sector. T-Systems is the main IT service provider of the Telekom and its 100% daughter company. In turn Telekom is the most important customer of the service provider T-Systems. T-Systems is the external service provider for many large companies such as Post AG, Shell, Bertelsmann, Bayer and several hundred more. Telekom is a joint stock company and has an inheritance from its privatisation in that over 35% of its employees are still civil servants. T-Systems operates in the communication and IT sector and it is Europe’s largest service provider for large companies. The Telekom has over 228,000 employees worldwide and T-systems has over 48,000 employees. Telekom has also several thousand IT specialists and also several thousand which work in IT related businesses. T-Systems has over 38,000 IT specialists due to its work as an IT service provider. Both companies have a network with over 228,000 users, over 100,000 PCs, over several thousand servers and several datacentres and reserve datacentres worldwide.
Telekom and T-Systems have heterogeneous networks of Unix and Windows servers and Windows 7 on the workstation systems. Since the nineties Telekom has outsourced large parts of its IT to T-Systems (e.g., the network and user administration, datacentre maintenance, programming of applications and desktop support). T-Systems’ IT specialists work directly in the same locations as the Telekom employees. The IT strategist explained that they have not had any large problems with their outsourcing projects because T-Systems, due to its experience as a service provider, is very professional. The aims and advantages of their current sourcing strategy of T-Systems and Telekom are full control over IT costs and highly optimised IT under the pressure of difficult market conditions. The IT strategist stated that key factors in the successful outsourcing strategy of Telekom and T-Systems are the highly trained IT specialists and the full control over the IT costs. Furthermore, he remarked that Telekom is so successful in the market due to the trust-based relationship and professional work of its service provider T-Systems.

**Strategic alignment**

The IT strategist said that the management of T-Systems and Telekom clearly defined the company’s IT strategy. The current IT division’s report is from 2011. Telekom has guidelines and processes which define the coordination of the IT strategy with the company’s strategy. He explained: “The company’s business strategy always defines the IT strategy. We have a long-term and short-term IT strategy that has been the same for several years. It is only adapted to current and future market conditions.” Furthermore, he said that the internal IT strategy is the optimisation of the IT infrastructure and processes, cost reduction and further centralisation in our external daughter company T-Systems. This also includes the standardisation of the company’s hardware and software and a central supply through preferred suppliers. Due to Telekom’s gigantic company size this is an enormous task with a lot difficulties and sources of resistance.
The IT sourcing strategy for the coming years is total outsourcing to T-Systems. “T-Systems has outsourced only approximately 10% of its IT to our outsourcing partners in Eastern Europe and in future to partners in South America. As one of the biggest outsourcing provider for large companies our customers would not accept that we also outsource too much of our IT.” The IT strategist mentioned that I should read the news from the Telekom and T-System’s public relations department to better understand their IT strategy. I sourced the relevant article dated the 19th March 2014. T-Systems does not make enough profit as an IT service provider due to intensive market competition and low profits in this field. Therefore, they optimise the costs by reducing staff for 4900 jobs in the next two years and the main focus of T-Systems is now cost reduction.

The company’s strategy is to invest in new IT business areas such as cloud services and IT consulting with less competitions and higher profits in order to become more independent from the classical IT outsourcing business. Furthermore, Telekom wants to cut three billion euros in management costs until 2018. In 2011 the Telekom had already cut 1600 jobs in management positions at the company’s headquarters. For this purpose Mc Kinsey is consultant to the Telekom for the BEST project (Build an Efficient and Smart Telekom), which is the coordination centre for all cost optimisation and cost reduction programmes at Telekom (manager magazine, 2011).

The IT strategist remarked that Telekom is at 50% an early adapter and at 50% a follower in terms of the introduction of new technology. Telekom’s current IT architecture can deliver maximum business support due to continuous investment in the IT. However, the CIO of T-Systems is responsible for the IT strategy decisions and regularly reports in meetings with the boards of directors of T-Systems and Telekom. IT is very important for the company’s business success because is the core of Telekom’s business model. All other Telekom business units also consider the company’s IT as irreplaceable for their daily tasks and the achievement of business objectives. He said that Telekom and T-systems do not use COBIT for the company’s IT governance but they have developed equivalent methods and processes.
**Value delivery**

The IT strategist indicated that the CIO decides about the internal and external allocation of IT resources. Most of Telekom's IT is centralised in T-Systems and therefore, most of all IT related decisions are made by this service provider. However, the Telekom board of directors is also involved in important decisions, changes and new projects. T-Systems has several departments dedicated to calculating the economic benefits of IT outsourcing. He iterated that the main focus is on cost reduction and optimisation. “We always make thousands of calculations, benchmarks and reports. We also compare our position and results with our competitors in the different businesses.”

The management is satisfied with the outsourced IT parts and processes, to the extent that IT outsourcing projects are planned with IT service providers in South America and Eastern Europe. In some cases Telekom establishes its own service provider in countries with a lower wage level. He said: “Our company is very satisfied with the IT structure and IT services, although we experience some problems due to fast changing market conditions.” Furthermore, the IT strategist remarked that their internal systems are high performant, robust, user-friendly and meet the highest data security standards. Additionally, their external systems that they host and administrate for large companies, e.g. Shell, are high level systems and equivalent in benchmarks with every other large company.

The IT strategist declared that the information delivered by T-Systems is fast, integer and accurate. “T-Systems and Telekom as worldwide active players meet all the required standards in the different countries and achieve increasingly better international benchmarks than competitors or other large companies.” He further added that he cannot divulge detailed information on the frequency of failed IT projects or unachieved objectives. He explained that he has been working for T-Systems for several years and during this time less than 20% of all IT projects failed or were not completed to the planned time, budget, or functionality, in the most cases the projects were cancelled due to unfavourable market conditions.
However, Telekom and T-Systems have clearly defined internal and external service levels although Germany is traditionally a service wasteland. For this purpose the company has several departments for contract facilitation and service level agreements. The responsibilities for IT processes, IT applications and IT infrastructure are clearly defined in accordance with the ITIL. Both Telekom and T-Systems have a vast experience merging IT with business requirements due to their role as a service provider for large companies.

**Risk management**

The IT strategist stated: “Telekom and T-Systems have risk frameworks certified to the ISO 27001/27002 standard for IT security. This important certification was necessary in order to satisfy all customer demands. T-Systems is the largest IT outsourcing provider for large companies in Europe.” Each of these companies develops their own risk framework and evaluates the IT risks relevant to its own business. However, Telekom’s internal IT service provider T-Systems assists the various divisions and evaluates the IT risks of its area, defining a risk framework as well. The all-important IT services and systems emergency plans and worst case scenarios were developed to ISO 27001/27002 standards and are continuously drilled. Telekom and T-systems spend a lot of money on backup lines, backup systems, reserve datacentres to satisfy customer demands and legal restrictions in different countries. Both companies train the internal IT staff in IT security and IT risk management. The management of Telekom and T-Systems evaluate the transparent IT risks in the business plans. Every minute of system downtime is calculated with all penalties and consequences for not hitting the SLA requirements. Further, the business objectives and strategies are also included in the IT risk management from initial start-up to the end of a business transaction. He explained that the IT costs, changes, projects, and risks are discussed by the board of directors of the T-Systems and Telekom during weekly status meetings. The IT strategist stated: “The primary focus of Telekom and T-Systems is to optimise costs but the various divisions want to increase IT performance, quality of IT services and IT security.”
This is a continuous conflict of top management and IT departments.” Every division has its own IT chief information security officer (CISO) who reports to the main CISO in the Bonn Corporate Centre. All internal and external IT processes are clearly defined and documented in accordance with the ITIL, but sometimes business is faster than the documentation. He remarked that T-Systems and Telekom try to develop a good relationship with its suppliers and service providers, but there are still too many. The strategy is to reduce the number of suppliers and providers and develop a trustful partnership with them. Telekom and T-Systems have a very professional customer management due to their job as a service provider. This is also a great advantage in the management of its own service providers and suppliers.

**Resource management**

The IT strategist said that T-Systems and Telekom do not very often hire external specialists, less than 10% depending on the field of knowledge, the project or business requirements and the availability of IT specialists in Germany. The company continuously broadens the IT specialists’ knowledge with internal and external training programmes and workshops. He explained: “We have a very good education system that can educate most of the IT specialists in the company. Furthermore, we have various study programmes such as the dual study degree where the student works as an apprentice in the company and simultaneously reads for a bachelor’s degree at our University of Applied Sciences for Telecommunication in Leipzig.”

He remarked that students can achieve read for a full time bachelor or master degree at this university and fully sponsored by the Telekom. Telekom started this educational programme several years ago as a result of the shortage of skilled IT specialists in Germany. However, he commented, the economic knowledge of the IT specialists is not very highly developed but their IT knowledge is in terms of their job and position very high, even in specialist areas of the IT. The company’s IT infrastructure is currently large enough to meet all business requirements. “We look only at the current situation but we now that we must invest continuously in our IT infrastructure to in order to meet customer demands in fast-changing and developing markets.”
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The IT strategist mentioned that it is due a good internal controlling system that the IT budget has never been overrun to realise business requirements. “In the past years working for T-Systems the company’s IT budget has not been overrun. In this case there is a problem with the business model or a failure of the internal IT controlling system. Although we constantly check the costs, the budget of our IT projects has sometimes been overrun.” However, the large size of the company, the IT processes work fast and effectively. The purchase of IT resources is made by several departments at T-Systems and Telekom and the entire supply is centralised, which is nearly equivalent to that of other large companies. The supply departments at the Telekom initiate a request for information (RFI) that is a market sounding to find possible suppliers.
This is followed by a request for quotations (RFQ) or a request for tenders (RFT) to potential suppliers accompanied by a detailed requirements specification and specifications. In many cases the Telekom requests for proposals (RFP) expecting offers from companies to meet the detailed specifications of service or the functional specifications. In some cases the Telekom make a request for features (RFF) to the suppliers, expecting a better offer. The IT strategist remarked that he cannot go into further detail. Complex processes to assess suppliers and providers with benchmarks and reports in an effort to reduce their numbers and have only preferred suppliers and providers.

**Performance measurement**

The IT strategist explained that Telekom and T-Systems spend a lot of resources in measuring the IT efficiency, economic efficiency of the IT and the achievement of the company’s objectives. “My department and several others make thousands of calculations, estimations, benchmarks and reports to obtain reliable data, but going into further detail would be beyond the scope of the interview.” He repeated that T-Systems is the largest outsourcing provider in Europe and has a full overview of what other large companies and competitors in the markets do.”
This is an important perspective, useful for current and future decisions and strategies. Telekom and T-Systems have an annual process in place for continuous IT optimisation. The results are discussed by the CIO and the boards of directors of T-Systems and Telekom. However, Telekom can only implement changes in the company’s IT structure slowly due to its enormous size but some IT projects are completed faster regardless of the costs and resources. He said that Germany is somewhat of a service wasteland, but they try to deliver the best service to internal and external customers. They therefore, make regularly surveys for customers and customer managers have regular telephone conferences and meetings with the customer keeping an ear open for problems and demands. Telekom and T-Systems have thousands of service levels for internal and external IT services, and several departments for the benchmarking and reporting of these service levels.

They also have several units dedicated to contract facilitation and service level management. The level of service depends on the demands of the customer and the resources and available to the customer. “Our SLAs are equivalent with the gold, silver and bronze service level our competitors provide, although we have other names for them.” Telekom and T-Systems have service levels contracts with all major hardware and software suppliers enable to meet all customer demands. The company has the classical IT structure for problem management with a trouble ticket system, hotline, first-level, second-level, third-level support and a very effective multi-level escalation system, that enables the quick and easy escalation of urgent problems to the top management regardless of company size.

“We are more expensive than most of competitors in the various markets, but we have a quality of service that other cannot deliver at the moment.” The company monitors the quality of IT suppliers and providers with surveys, benchmarks and reports as well as regular meetings of the decision-makers. Critical issues and urgent matters are always directly escalated to the top management which is constantly kept informed by the internal control system. The CIO reports to the boards of directors of Telekom and T-Systems in weekly meetings, keeping the top management always informed about the current status of the company’s IT.
Results of the case study

Figure 54: Summary of the case study at Deutsche Telekom and T-Systems
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IT outsourcing success

The IT strategist repeated that Telekom and T-Systems reaps economic advantages (1.28, see figure 5) from the IT outsourcing objective. They achieve very large benefits due to cost reductions and increasing the control of and flexibility in costs. Their main focus is cost optimisation and cost reduction. In contrast to this the Telekom does not achieve technical advantages (-0.4) from their IT outsourcing strategy. He further concluded that IT outsourcing increases neither the quality of service nor increase the IT security in the outsourced areas and does do not reduce the company’s IT risks.

The IT strategist is unsure whether external assistance keeps Telekom’s and T-System’s IT architecture state of the art but he knows that they have access to new know-how due to external specialists. However, he explained, the same applies to the strategic IT outsourcing success because Telekom and T-Systems achieve no real strategic benefits from their IT outsourcing strategy (-0.5). IT outsourcing does not make Telekom and T-Systems more independent from internal staff, training, and recruiting. He is also unsure whether the company can introduce changes and innovations faster or can concentrate more on the core business as a result of IT outsourcing. Telekom and T-Systems have a slight overall outsourcing success (0.12) due to the high economic advantages. This is also the reason for further IT outsourcing plans at Telekom and T-Systems.
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Thesis from Uwe Blind

Figure 55: IT outsourcing success at Deutsche Telekom and T-Systems

Figure 56: Outsourcing benefits for Deutsche Telekom and T-Systems
13. Study findings

13.1. Overview of the measurements of IT outsourcing success

Table 16 shows the ranking of the organisations and companies in achieving economic advantages. Telekom and T-Systems rank the highest for unlocking of benefits economic outsourcing (1.25) because they are extremely successful in reducing costs, while increasing control of IT costs and flexibility of IT costs. They reach the highest value in all categories.

<table>
<thead>
<tr>
<th>Economic advantage</th>
<th>Reduce IT costs</th>
<th>Increase control of IT costs</th>
<th>Increase flexibility of IT costs</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telekom/ T-Systems</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1.25</td>
</tr>
<tr>
<td>Police Presidium Dortmund</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0.34</td>
</tr>
<tr>
<td>LZPD (Police Central Services)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0.34</td>
</tr>
<tr>
<td>Ministry of the Interior</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Police Presidium Hagen</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-0.34</td>
</tr>
<tr>
<td>Ruhrpumpen</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>-0.34</td>
</tr>
<tr>
<td>Bertelsmann</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>-0.34</td>
</tr>
</tbody>
</table>

Table 21: Company ranking: perceived success in achieving economic benefits

This is not surprising because T-Systems is the largest IT outsourcing provider for large companies in Europe. The PP Dortmund and LZPD have slight economic advantages (both 0.34), because, due to their IT outsourcing strategy these authorities can increase control only over IT costs. The MIK is neither successful nor unsuccessful in achieving economic benefits (0).
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

The PP Hagen, Ruhrpumpen and Bertelsmann (all -0.34) are not successful in unlocking economic benefits from their IT outsourcing strategy. The PP Hagen is unsuccessful in reducing IT costs or increasing the flexibility of its IT costs but it can increase the control of its IT costs. Ruhrpumpen and Bertelsmann cannot reduce their IT costs with the IT outsourcing strategies; nor are these companies successful or unsuccessful in increasing control or flexibility of the IT costs.

<table>
<thead>
<tr>
<th>Technical Advantages</th>
<th>Access to new know-how</th>
<th>Keep company’s IT state of the art</th>
<th>Reduce IT risks</th>
<th>Increase IT security</th>
<th>Increase quality of service</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police Presidium Hagen</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Police Presidium Dortmund</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Ruhrpumpen</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>LZPD (Police central services)</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Ministry of the Interior</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bertelsmann</td>
<td>1</td>
<td>0</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
<td>-0.2</td>
</tr>
<tr>
<td>Telekom/T-Systems</td>
<td>1</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-0.4</td>
</tr>
</tbody>
</table>

Table 22: Company ranking: perceived success in achieving technical advantages

The ranking for achieving technical advantages is summarised in table 17. The PP Hagen occupies the first place in the rankings for achieving technical benefits from IT outsourcing strategy (1.2). While it has high scores in all categories, it reaches the highest score “access to new know-how”. The PP Dortmund and Ruhrpumpen are quite successful in achieving technical benefits (0.8).
PP Dortmund is successful in all categories except in keeping the company’s IT state of the art. Ruhrpumpen has the highest value in increasing the quality of services and, due to the company’s IT outsourcing strategy, also achieves good scores in the categories “access to new know-how” and “reduce IT risks”. The MIK is neither successful nor unsuccessful in unlocking technical IT outsourcing potentials (all 0) from its IT outsourcing strategy of the police force. Bertelsmann has a slight negative score (-0.2) because the company cannot reduce its IT risks or increase the quality of service. However, the company does have access to new know-how due to IT outsourcing.

<table>
<thead>
<tr>
<th>Strategic advantages</th>
<th>Concentrate on core business</th>
<th>Independence from internal IT staff</th>
<th>Independence from training and recruitment</th>
<th>Faster introduction of innovations and changes</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police Presidium Dortmund</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Ruhrpumpen</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>LZPD (Police central services)</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.75</td>
</tr>
<tr>
<td>Police Presidium Hagen</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-1</td>
<td>0.25</td>
</tr>
<tr>
<td>Bertelsmann</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>0.25</td>
</tr>
<tr>
<td>Ministry of the Interior</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Telekom/ T-Systems</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>-0.5</td>
</tr>
</tbody>
</table>

Table 23: Company ranking: perceived success in achieving strategic advantages
Telekom and T-Systems are not able to achieve technical benefits (-0.4) and have the lowest ranking. The companies have access to new know-how but can neither reduce IT risks nor increase the control over IT costs, nor can they increase the flexibility of IT costs. The table 18 indicates that the majority of the companies and authorities are able to achieve strategic benefits from IT outsourcing strategies. The PP Dortmund, in comparison to the other organisations, is the most successful (1.2) because it has the highest independence from internal staff. Furthermore, the PP Dortmund also reaches high values in all of the other categories. Ruhrpumpen occupies the second rank (1.0). This company can introduce very fast innovations and changes due to their IT outsourcing strategy. However, it also has good independence from internal staff, training and recruitment. The LZPD reaches the third rank (0.75) and achieves good strategic advantage in nearly all categories. Bertelsmann and the PP Hagen can only unlock slight strategic benefits (both 0.25) from their IT outsourcing strategies. The PP Hagen is only successful in the categories “concentrate on the core business” and “independence from internal IT staff”. It also cannot introduce changes and innovations faster with an external service provider.

<table>
<thead>
<tr>
<th>Overall IT outsourcing success</th>
<th>Economic advantage</th>
<th>Technical advantage</th>
<th>Strategic advantage</th>
<th>Overall outsourcing success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police Presidium Dortmund</td>
<td>0.34</td>
<td>0.8</td>
<td>1.2</td>
<td>0.78</td>
</tr>
<tr>
<td>LZPD (Police central services)</td>
<td>0.34</td>
<td>0.6</td>
<td>0.75</td>
<td>0.56</td>
</tr>
<tr>
<td>Ruhrpumpen</td>
<td>-0.34</td>
<td>0.8</td>
<td>1</td>
<td>0.49</td>
</tr>
<tr>
<td>Police Presidium Hagen</td>
<td>-0.34</td>
<td>1.2</td>
<td>0.25</td>
<td>0.37</td>
</tr>
<tr>
<td>Telekom/ T-Systems</td>
<td>1.25</td>
<td>-0.4</td>
<td>-0.5</td>
<td>0.12</td>
</tr>
<tr>
<td>Ministry of Interior</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bertelsmann</td>
<td>-0.34</td>
<td>-0.2</td>
<td>0.25</td>
<td>-0.1</td>
</tr>
</tbody>
</table>

Table 24: Company ranking: perceived overall outsourcing success
Bertelsmann can activate slight strategic outsourcing benefits from its independence from internal staff and independence from training and recruitment. Due to its IT outsourcing, the company cannot introduce innovations and changes faster. The MIK is neither successful nor unsuccessful in achieving strategic benefits from its IT outsourcing strategy of the police force (all 0). Telekom and T-Systems are quite unsuccessful in achieving a strategic advantage from IT outsourcing strategies. These companies are not independent from internal staff, training and recruitment. As written in a previous chapter, the overall IT outsourcing success was calculated by using the average value of the strategic, economic and technical advantages.

The PP Dortmund has a good “overall outsourcing success” score (0.78) due to high values in the categories technical and strategic advantages. The LZPD is also quite successful (0.56) with positive values in all categories. Ruhrpumpen as the first company achieves an overall outsourcing access of 0.49 because it can activate technical and strategic advantages. The PP Hagen has a positive overall outsourcing success (0.37) because it achieves high technical benefits from its IT outsourcing strategy. Telekom and T-Systems have only a small overall outsourcing success (0.12) because they can only use high economic advantages from their IT outsourcing strategy. The MIK does not have overall outsourcing success nor does it achieve any technical, economic or strategic benefit from its IT outsourcing strategy of the police force. Bertelsmann has the lowest overall outsourcing success value (-0.1) since it is not successful in any category.

The results of the three police authorities are very similar which increases the validity of the data. The high police rankings in all four categories show how successful the current IT outsourcing strategy is. The police unlock the highest strategic and technical benefits. In contrast to Bertelsmann and Telekom and T-systems, the police use IT outsourcing potentials more effectively. Similar results in the three police authorities make the further analysis of the data easier. Kakabadse and Kakabadse (2001) identified four key reasons for outsourcing decisions in the public service: achieving best practice solutions, improving the cost discipline of managers, improving the quality of service, and concentrating of the public service on its core tasks. My results are similar to Kakabadse and Kakabadse (2001).
13.2. Findings of cross-case analysis

The aim of private companies is to make profits, increase market share and create private value. Telekom and T-Systems are listed companies and their primary objective is to satisfy their stockholders. But also 32% of the Telekom’s shares belong still to the state. 90% of Bertelsmann belongs to the Bertelsmann foundation and 10% to the Mohn family and has to fulfil the aims of the owners and the foundation. Ruhrpumpen is 100% owned by a Mexican family. Therefore, the company has to fulfil the goal of the owner, i.e., to become the third largest pump engine producer in the world. This sample of four companies provides a general overview of possible company types: Two listed companies a privately owned company and a company owned by a foundation. Moore published in 1995 a book with his new ideas about creating public value. In 2011, Moore et al. published a new book with the title “public value theory and practise” that was used in my research. This book is a guideline to create public value in practise based on his theory from 1995.

In the literature review I wrote about Moore’s theory to create public value. According to Moore’s theory, the public service can create a higher public value if local managers in the public service can manage their departments with large enterprising, decision-making power. In the past, authorities in the public service had greater authority to make decisions (German “Direktionsrecht” – and English “managerial authority”) but often misused their power and ignored direct orders of the Ministry of the Interior. During the interview the IT manager of the PP Hagen said: “A mistrial order is however we interpret it.” For example, in the migration phase from Windows NT to Windows XP the minister ordered that the more than 1,700 applications that the local police authorities had themselves programmed not be migrated. This order clearly forbade these applications in the new system and also forbade the police authorities from programming new applications. Now, seven years later in the new migration phase from Windows XP to Windows 8 the LZPD has discovered that the authorities have now over 3,000 self-programmed applications.

The interviews at PP Hagen and PP Dortmund showed that the police authorities fear the further centralisation of IT and the loss of power, influence, and job security. The IT manager at PP Hagen decided to exchange the PCs during the yearly PC reinvestment cycle without the assistance of the external service provider.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

<table>
<thead>
<tr>
<th>Company</th>
<th>Perceived ITO success</th>
<th>Strategic alignment</th>
<th>Value delivery</th>
<th>Risk management</th>
<th>Resource management</th>
<th>Performance measurement</th>
</tr>
</thead>
</table>
| Police Presidium Dortmund | 0.78 | - clear IT strategy  
- very dependent on IT  
- clear centralisation at LZPD  
- outtasking strategy at IT.NRW  
- late technology follower  
- strong political influence | - internal and external IT service levels  
- IT projects often fail  
- clear IT responsibilities  
- LZPD and IT.NRW in competition with each other  
- sometimes there are service quality problems at LZPD  
- LZPD/ MIK decide on the use of internal and external resources | - clear risk framework  
- CISO in all locations  
- high IT security  
- IT processes documented  
- emergency plans practised at LZPD  
- no relationship with providers/suppliers  
- management is always informed about current status of IT | - guidelines for resource supply  
- shrinking IT budget every year  
- reducing IT staff in authorities  
- staff training centre at LAFP/IT.NRW  
- clear resource management process  
- clear process for the use of internal and external staff  
- staff in authorities lose IT know-how | - regular meetings of IT manager with management  
- internal control system for IT at LZPD  
- performance and quality benchmarking at LZPD/IT.NRW  
- processes for IT optimisation  
- monitoring of internal and external service level agreements  
- benchmarking for providers/suppliers |
| LZPD (Central Police Services) | 0.56 | - clear IT strategy  
- very dependent on IT  
- clear centralisation at LZPD  
- outtasking strategy at IT.NRW  
- late technology follower  
- strong political influence | - internal and external IT service levels  
- IT projects often fail  
- clear IT responsibilities  
- LZPD and IT.NRW in competition with each other  
- sometimes there are service quality problems at LZPD  
- LZPD/ MIK decide on the use of internal and external resources | - clear risk framework  
- CISO in all location  
- high IT security  
- IT processes documented  
- emergency plans practised at LZPD  
- no relationship with providers/suppliers  
- management is always informed about current status of IT | - guidelines for resource supply  
- shrinking IT budget every year  
- reducing IT staff in authorities  
- staff training centre at LAFP/IT.NRW  
- clear resource management process  
- clear process for the use of internal and external staff  
- staff in authorities lose IT know-how | - regular meetings of IT manager with management  
- internal control system for IT at LZPD  
- performance and quality benchmarking at LZPD/IT.NRW  
- processes for IT optimisation  
- monitoring of internal and external service level agreements  
- benchmarking for providers/suppliers |

Table 25: Cross-case analysis of COBIT domains, ranked by perceived IT outsourcing (ITO) success (Part 1)
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

<table>
<thead>
<tr>
<th>Company</th>
<th>Perceived ITO success</th>
<th>Strategic alignment</th>
<th>Value delivery</th>
<th>Risk management</th>
<th>Resource management</th>
<th>Performance measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruhrpumpen</td>
<td>0.49</td>
<td>- no real IT strategy for all locations</td>
<td>- high cost optimisation</td>
<td>- no risk framework</td>
<td>- too small IT staff and IT budget</td>
<td>- gut feeling of CEO to measure performance and success of IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT driven by business</td>
<td>- IT projects often fail</td>
<td>- IT risks part of the company’s strategy</td>
<td>- no process for resource management</td>
<td>- daily telephone conference calls with the owners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- very dependent on IT</td>
<td>- no internal and external service levels</td>
<td>- no CISO/ low IT security</td>
<td>- focus on saving money</td>
<td>- no internal control system for IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- insourcing strategy</td>
<td>- no clear IT responsibilities</td>
<td>- most IT processes are documented</td>
<td>- externals only in case of problems</td>
<td>- no benchmarking for service providers and suppliers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- late technology follower</td>
<td>- IT locations are in competition with each other</td>
<td>- management knows IT risks and they are not part of their IT strategy</td>
<td>- every costs over Euro 2,000 has to be vetted by owner</td>
<td>- no IT optimisation process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- strong regulation by the Mexican owner</td>
<td>- owner not satisfied with IT</td>
<td>- good relationship with suppliers and providers</td>
<td>- no process for supplier and service provider management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- advantages of outsourcing not used</td>
<td>- no emergency plans are trained</td>
<td>- familiar providers are preferred</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- several lacks in IT security in the past</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Police Presidium Hagen</td>
<td>0.37</td>
<td>- IT strategy paper from 2009</td>
<td>- MIK and LZPD decide on the use of internal and external resources</td>
<td>- CISO in all locations</td>
<td>- local IT manager has only few possibilities to act</td>
<td>- regular meetings with LZPD/MIK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- late technology follower</td>
<td>- IT projects often fail</td>
<td>- clear risk framework</td>
<td>- focus on outsourcing/ centralisation to LZPD/IT.NRW</td>
<td>- service level checks at LZPD/IT.NRW and for providers/suppliers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- MIK and IT steering group define strategy</td>
<td>- clear service level internally and for service providers/suppliers</td>
<td>- processes are documented</td>
<td>- LHO guidelines for supply</td>
<td>- Internal management meetings at authorities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- centralisation of IT at LZPD</td>
<td>- secure and robust systems</td>
<td>- emergency plans have to be improved</td>
<td>- IT budgets always too small</td>
<td>- no service level monitoring at authorities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT outsourcing strategy at IT.NRW</td>
<td>- due to bugs long downtimes of important applications</td>
<td>- good IT security but not state of the art in some areas</td>
<td>- clear supplier management process</td>
<td>- no internal IT control system in authorities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- strategy is influenced by current governing party</td>
<td>- problems with providers in the past</td>
<td>- several long downtimes of important applications in the past</td>
<td>- staff training centre at LAFP/IT.NRW</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT is very important for the police</td>
<td></td>
<td>- no relationship with suppliers/providers</td>
<td>- local staff backbone of the police’s IT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 26: Cross-case analysis of COBIT domains, ranked by perceived IT outsourcing (ITO) success (Part 2)
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Table 27: Cross-case analysis of COBIT domains, ranked by perceived IT outsourcing (ITO) success (Part 3)

<table>
<thead>
<tr>
<th>Company</th>
<th>Perceived ITO success</th>
<th>Strategic alignment</th>
<th>Value delivery</th>
<th>Risk management</th>
<th>Resource management</th>
<th>Performance measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telekom/ T-Systems</td>
<td>0.12</td>
<td>- short-term and long-term IT strategy</td>
<td>- high cost optimisation in all areas</td>
<td>- good and clear risk frameworks</td>
<td>- clear processes for resource management</td>
<td>- regular meetings with managers/customers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT strategy for all units clearly communicated</td>
<td>- Telekom/ T-Systems management satisfied with IT and provided services</td>
<td>- IT processes are documented (in accordance with the ITIL)</td>
<td>- focus on cost optimisation/ reduction</td>
<td>- internal and external service level benchmarking/reporting providers/suppliers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT outsourcing strategy on T-Systems</td>
<td>- management satisfied with outsourced IT</td>
<td>- never overrun of IT budget</td>
<td>- occasional overrun of IT project budget</td>
<td>- benchmarking units with competitors in the various markets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT standardisation/ optimisation strategy</td>
<td>- less than 20% of all IT projects fail</td>
<td>- good internal education/ training systems</td>
<td>- annual IT optimisation process</td>
<td>- annual IT optimisation process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- in 50% of the cases technological follower</td>
<td>- internal and external service level agreements and contract facilitation</td>
<td>- own University, dual study system, good own vocational school system</td>
<td>- multilevel escalation system (in accordance with ITIL)</td>
<td>- very efficient internal control system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- in 50% of the cases technological pioneer</td>
<td>- very secure, robust, user-friendly systems</td>
<td>- centralised supply at T-Systems and Telekom</td>
<td>- measurement of IT efficiency / IT profitability</td>
<td>- very efficient internal control system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT out-tasking strategy &lt;10% at T-Systems</td>
<td>- clear IT responsibilities</td>
<td>- IT staff have only low economic skills but high technical skills, even in specialist areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT part of the business model for all units</td>
<td>- advantages of IT outsourcing used</td>
<td>- clear processes for resource management</td>
<td>- measurement of IT efficiency / IT profitability</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- very dependent on IT</td>
<td>- meeting of all required standards in the various countries</td>
<td>- clear processes for resource management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- T-Systems cuts 4900 jobs over next 2 years</td>
<td>- T-Systems profitability problems</td>
<td>- clear processes for resource management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ministry of the Interior</td>
<td>0</td>
<td>- IT strategy valid for 5 years</td>
<td>- MIK decide on the use of internal and external resources</td>
<td>- clear risk frameworks</td>
<td>- focus on reducing internal IT staff</td>
<td>- regular meetings with LZPD/MIK/KPBs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- reach strategic milestones</td>
<td>- MIK satisfied with IT/ provided services</td>
<td>- LHO guidelines for supply</td>
<td>- service level checks at LZPD/IT.NRW and for providers/suppliers</td>
<td>- service level checks at LZPD/IT.NRW and for providers/suppliers</td>
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<tr>
<td></td>
<td></td>
<td>- MIK defines IT strategy</td>
<td>- Only 20% of all IT projects fail</td>
<td>- public tenders for all IT investments</td>
<td>- permanent IT optimisations</td>
<td>- permanent IT optimisations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- centralisation of IT at LZPD</td>
<td>- clear service level internally and for service providers/suppliers</td>
<td>- fix budget, slow and inflexible system</td>
<td>- no service level monitoring at authorities</td>
<td>- no service level monitoring at authorities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IT outsourcing strategy at IT.NRW</td>
<td>- secure and robust systems</td>
<td>- process for management of resources</td>
<td>- internal control system</td>
<td>- processes for project acceptance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- strong political influence</td>
<td>- authorities oft unsatisfied with IT services</td>
<td>- shrinking IT budgets always too small</td>
<td>- benchmarking of IT aims/ efficiency</td>
<td>- benchmarking of IT aims/ efficiency</td>
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<td></td>
<td></td>
<td>- functioning IT for modern police work</td>
<td>- problems with providers in the past</td>
<td>- staff training centre at LAFP/IT.NRW</td>
<td>- high information exchange at MIK/LZPD</td>
<td>- high information exchange at MIK/LZPD</td>
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<tr>
<td></td>
<td></td>
<td>- IT strategy clearly communicated</td>
<td>- MIK decide on the use of internal and external resources</td>
<td>- always external IT specialists at LZPD</td>
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<tr>
<td></td>
<td></td>
<td>- authorities try to subvert MIK’s decisions</td>
<td>- MIK satisfied with IT/ provided services</td>
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</tbody>
</table>

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Thesis from Uwe Blind

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### Table 28: Cross-case analysis of COBIT domains, ranked by perceived IT outsourcing (ITO) success (Part 4)

<table>
<thead>
<tr>
<th>Company</th>
<th>Perceived ITO success</th>
<th>Strategic alignment</th>
<th>Value delivery</th>
<th>Risk management</th>
<th>Resource management</th>
<th>Performance measurement</th>
</tr>
</thead>
</table>
| Bertelsmann   | -0.1                   | - short-term and long-term IT strategy  
- IT strategy for all units clearly communicated  
- IT insourcing strategy with five decentralised independent units  
- technological follower in terms of internal cross-divisional IT/early adapter and pioneer in terms of IT at the divisions  
- IT centralisation at internal service provider  
- IT out-tasking strategy for less than 10% of IT  
- IT part of the business model for all units  
- very dependent on IT | - high cost optimisation in all areas  
- management satisfied with IT and provided services in the 5 divisions  
- management satisfied with IT/provided services in the outsourced areas  
- less than 20% of all IT projects fail  
- internal and external service level agreements and contract facilitation  
- secure and robust systems  
- clear IT responsibilities in all areas  
- advantages of IT outsourcing in few areas of the IT infrastructure exploited  
- high IT service quality/good IT infrastructure | - good and clear risk frameworks  
- IT processes are documented (in accordance with the ITIL)  
- emergency plans are regularly drilled  
- good IT security, CISO in all locations  
- backup lines, - systems and – datacentres  
- ISO 27001/27002 certification for IT security  
- no relationship to suppliers and service providers  
- Too many service providers and suppliers  
- IT risks part of company’s IT strategy  
- service contracts with suppliers and | - no clear process for resource management  
- focus on cost optimisation  
- sometimes overrun of IT budget and IT project budget  
- good internal education/training programmes  
- reduction model to select suppliers/providers  
- many external specialist for new projects  
- staff with high economic and technical skills  
- training workshops at external partners | - regular managers/customers meetings  
- SLAs benchmarking/reporting providers/suppliers  
- benchmarking divisions with competitors  
- annual IT optimisation process  
- fast and effective multi-level escalation system in accordance with the ITIL  
- internal control system  
- measurement IT efficiency/IT profitability  
- Eco-finance program to check aims  
- weekly IT meetings of board of directors  
- flat organizational structure with a fast information exchange |

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Although the MIK had given the direct order for all PC reinvestment cycles to be done with the assistance of an external service provider in order to save money and internal human resources. This because the local IT-manager was not satisfied with the service provider’s quality of service. Such an example shows that authorities always try to “paddle their own canoe”. The MIK forces a complete centralisation strategy on the internal service provider of the police force LZPD and an out-tasking strategy on the state’s internal service provider IT.NRW. This strategy weakens the local IT manager in the authorities while strengthening the influence of the Ministry. This means that Moore’s public value theory is not supported by the state’s IT strategy.

Critics of Moore’s theory state that local managers in authorities should not influence the decisions of the Minister. The results of the interviews showed that authorities can create public value without satisfying Moore’s theory. It is obvious that the reduction of IT staff in the local IT department reduces the influence of the authorities but also leads to a reduction of IT costs and an optimised IT infrastructure. I further proved that large companies strengthen their local IT manager to create private value. Companies too use an IT centralisation strategy and weaken the influence of the local management.

The CEO of the German location of Ruhrpumpen said in the interview: “Every investment over Euro 2,000 must be approved by the Mexican owner.” This is astounding for a company with over 3,500 employees worldwide and should reduce the effectiveness of the entire business. The research results showed that Ruhrpumpen is quite successful in the market having a good IT outsourcing strategy it also has had some significant problems with IT. This example demonstrates that Moore’s theory does not hold. Telekom and T-Systems use a complete IT centralisation strategy to T-Systems which is very successful in achieving economic benefits. This also meant that the local IT management does not have much decision-making power. The Telekom’s IT strategy also could be defined as a complete IT outsourcing strategy because T-Systems operates as an independent company in the market and is Europe’s largest IT service provider for large companies.
These companies disproved Moore’s theory because they have used this IT strategy for several years and it was quite successful in the past. In the few last years, Telekom and T-systems both cut several thousand jobs due to difficult market conditions. Both companies have to optimise costs and reconsider their current business strategy. In contrast to this is the decentralisation strategy of Bertelsmann that is very successful in the various markets. The company has centralised IT tasks to the internal IT service provider but local IT managers in the five divisions have broad decision-making power. The five divisions are independently managed by the local management without a large influence from the company’s top management. Although Bertelsmann bucked important internet trends the company appears to have the right IT strategy for the future. This example proved Moore’s theory because even young employees at Bertelsmann step in leading positions with very high decision-making power very early on.
13.3. **Analysis of core IT capabilities**

**IT governance/ leadership**

IT governance capability belongs to the COBIT focus area strategic alignment. In the interviews of the police authorities PP Hagen, PP Dortmund and LZPD and the Ministry of the Interior (MIK) said that they have a clear IT strategy, as well as an IT strategy paper from 2009, which was valid for five years. The MIK defines and creates IT visions and strategies, which are strongly influenced by politics. All of the IT organisations mentioned that the police could not work without IT. The state’s current strategy is clearly a centralisation strategy to LZPD and an out-tasking strategy to IT.NRW. LZPD and MIK report that the current IT strategy is transparent and clearly defined. The IT manager of PP Hagen and PP Dortmund said that they did not understand 100% of the current IT strategy. All authorities determine themselves as late technology followers. So it was obvious that it is important that management transfer the IT visions to the whole organisation.

Telekom, T-Systems and Bertelsmann have a short-term and a long-term IT strategy. They mentioned in the interview that the current IT strategy is clearly communicated. The Telekom and T-Systems are 50% a technological follower and 50% an early adapter. In the terms of internal cross-division, Bertelsmann is an early adapter and a pioneer in terms of IT at the divisions. All three organisations are very dependent on IT. For all three companies IT is part of their business model. Telekom forces a centralisation strategy to its internal service provider T-Systems and uses an out-tasking strategy with less than 10% outsourced to external providers. T-Systems and Telekom force IT standardisation and optimisation strategy with an extreme job reductions.

Bertelsmann has a centralisation IT strategy to an internal service provider and an out-tasking strategy of less than 10% for the IT tasks. The last company Ruhrpumpen has no real IT strategy although it really depends on IT. Ruhrpumpen wants to build up an insourcing and centralise to Monteray headquarters in Mexico. The company is a late technology follower and is strongly regulated by the owner.
Ruhrpumpen is the negative example where IT is driven by the business and has large IT optimisation potential. All the other organisations have clear IT visions and have centralised their IT to an internal service provider. The selective outsourcing strategy with short-term contracts with several service providers in combination with an internal service provider was a successful strategy for the police, Bertelsmann, Telekom and T-Systems. I proved Lacity and Curie’s (1997) theory that the organisations use the selective outsourcing strategy because the full outsourcing strategy is too risky and unsuccessful.

I also proved Willcocks and Curie’s results that centralisation to an internal service provider and selective outsourcing to several service providers on the basis of relatively short-term contracts successfully improved flexibility, reduced costs, and optimised quality of services and control over the IT activities in a fast changing environment. My study shows that the internal service providers in the subject organisations are cheaper and better and this is often not considered in outsourcing decisions. This is also the reason why the service provider T-Systems has problems with the profitability of its business model.

It is clear that all the organisations are very dependent on IT and the primary objective of IT is to support business. Bertelsmann, Telekom and T-systems are exceptions since they are technological pioneers in new business areas. However, because they explore new business areas, they are also late technological followers since the primary aim is to keep systems running without experiments. From research the following topics can be concluded. Centralisation with an internal provider is a successful strategy for every company or organisation. The standardisation of hardware and software and the central supply is an important column in the IT strategy for the police, Bertelsmann, Telekom and T-Systems. A large organisation should have a clear IT vision with a short-term and long-term IT strategy. New technology should be introduced only if it is secure, proven and necessary. Furthermore, I concluded that standardisation and central supply in the IT are sensible to optimise IT architecture, costs and resources.
The results of Lacity and Willcocks (2014) study close the gap in my research because standardisation, centralisation, optimisation and automation are common trends in the IT; however these results were not supported by theory in the past. In the current study, I found that Lacity and Willcocks (2014) transformation levers (centralisation, standardisation, optimisation, technology enablement and automation and labour transfer to low-cost location) were achieved at Bertelsmann, Telekom and T-Systems. Bertelsmann, Telekom and T-Systems achieve high levels of implementation in this way; they also have good IT governance in this area and a highly effective IT environment.

My research results support Lacity and Willcocks’ (2014) theory that standardisation, centralisation and optimisation in the IT optimise an organisation’s entire IT environment of Bertelsmann, the police, Telekom and T-Systems. It is obvious that the companies followed the standardisation, centralisation and optimisation trend in the IT for more than a decade and Lacity and Willcocks (2014) developed a theory based on these researched phenomena.

Business systems thinking (process management)

From the interviews it was said that the management from all organisations know the IT requirements of their business and that the business is very dependent on IT. The main aim of IT is to assist the business optimally. The management of the police are always informed about the current status of the IT and have developed IT processes, frameworks, IT risk frameworks. The top management Bertelsmann, Telekom and T-Systems have weekly meetings where IT is an important topic. They have calculated IT risks in their IT strategy and have developed processes, frameworks and IT risk frameworks. In contrast, the management of Ruhrpumpen, know the IT and the IT risks but it is not part of the IT strategy. All organisations in the sample have documented their processes but none of them use COBIT for their IT processes. Except of Ruhrpumpen, all organisations document their processes in accordance with the ITIL in combination with their own frameworks.
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However, police, Bertelsmann, Telekom and T-System have a yearly IT optimisation process which is important for the further process optimisation. I concluded from the results that the business system thinking capability is important for large organisations to optimise IT and business processes. This capability also influences the capabilities of architecture planning and making technology work. Furthermore, ITIL is important to activate these three capabilities.

Relationship building (communication)

This capability belongs to the COBIT focus area risk management. In the interviews the IT managers of the police said that the management is always informed about the current status of the IT. The IT management of Bertelsmann and Telekom and T-systems also state that their management is always informed about current status of IT. The IT specialists in the police have only low economic skills but they know the special features of modern police work and public police service optimally in the daily business. The managers of Ruhrpumpen, Telekom and T-Systems said that their technicians have only low economic skills and therefore are not able to understand their users.

In contrast, Bertelsmann’s specialists have high economic knowledge and therefore are able to understand their users in a better way compared to the other companies. This is an important topic in the COBIT focus area of resource management. In the interview every organisation’s authority stated that there is a continuous exchange of the IT with management and the IT users. Therefore, relationship building is important but the research has shown that good communication between IT specialists, users and the management is also necessary for success. In general Ruhrpumpen has daily telephone conference calls with the owner. The police authorities have a meeting of all department managers every two weeks and additional meetings of all department managers of the service department. Every few month the head of authorities have meetings with the MIK and the top management of the police force.
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At Bertelsmann weekly meetings are held with the top management where IT is one of the most important points. This is similar to Telekom and T-Systems. There are also weekly and daily meetings of the IT managers together with the top management of Telekom and T-Systems. All the organisations interviewed agreed that their management is always informed about the current status of IT. All organisations said that it is important to communicate clearly the IT strategy. Only Ruhrpumpen did not communicate an exact IT strategy although they are trying to introduce it. The topic belongs to the COBIT of focus area strategic alignment.
Except of Ruhrpumpen all organisations have clear IT responsibilities. Bertelsmann has clear flat hierarchies, clear responsibilities and a fast information exchange. The state NRW has two main mails systems Exchange and E-post. Urgent official information is sent over E-post. Bertelsmann, Telekom and T-Systems also have a fast information exchange, clear hierarchies and clear IT responsibilities. Telekom started the project overhead to cuts jobs in the Bonn headquarters and to optimise its communication and hierarchy structure.
These topics belong to the COBIT focus areas value delivery, resource management and performance management. I concluded from the results that relationship building and especially communication is important for all COBIT focus areas. The research has shown that large organisations need clear flat hierarchies and clear IT responsibilities and fast information exchange. The police have a slower information exchange than Bertelsmann and Telekom because the police have too many hierarchies.

Architecture planning
Many topics here were already mentioned before but the architecture planning is influenced by the capabilities IT governance and business system thinking. The research has shown that all police authorities and organisations in this sample except Ruhrpumpen have a clear IT strategy which is able to optimally assist the core business. A clear IT strategy is the basis for good planning of the IT architecture.
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Telekom and T-Systems as well as Bertelsmann have both short-term and long-term IT strategies. The MIK and the police force have an IT strategy valid for five years and want to reach strategic milestones. This topic belongs to the COBIT focus area of strategic alignment.

The police authorities have a centralisation strategy to the internal service provider of the police LZPD. The LZPD has an out-tasking strategy to the state internal service provider IT.NRW. The Telekom has outsourced their complete IT to daughter company T-Systems. T-systems force an out-tasking strategy to external providers. Bertelsmann has centralised large parts of its IT to an internal service provider and but also out task to other service providers. Ruhrpumpen wants to establish an in sourcing strategy on the internal service provider at their headquarters in Mexico and sources back IT parts which are outsourced to external service providers. All of the interviewed organisations already have or want to centralise IT to internal service providers. However, they also force an out-tasking strategy of smaller parts of the IT organisation. All organisations stated that they are technological followers or late technological followers.

This meant that the organisation only uses 100% working technology since they are too large to introduce quickly the newest technology. However, the companies are very dependent on IT and therefore, they cannot risk any experiments. A further topic is that all organisations already build up or want to introduce a continuously IT standardisation and IT optimisation strategy. Telekom and T-Systems as well as Bertelsmann are the only early adapters or pioneers if they build up new businesses. This was obvious because the organisations have more than several thousand employees. Good IT architecture optimises costs, quality of service and the effectiveness of the business.

As already mentioned under the business systems thinking capability, none of the interviewed organisations use COBIT for their IT. The police, Bertelsmann, Telekom and T-System uses ITIL best practise processes in combination with their own framework. Bertelsmann, Telekom and T-Systems achieved the ISO 27001/ 27002 for IT security and uses it for their IT risk framework.
The police want to achieve this certification in the next years but they already follow this guideline and also the BSI guideline. BSI, ITIL and ISO 27001 are frameworks and standards to improve the effectiveness of an organisation's IT environment. The results of my research underpin the results of Huang et al. (2009) and Krisanthi et al. (2014) that all organisations combine different frameworks and standards (e.g. ITIL, BSI and ISO 27001) in order to optimise and standardise their IT environment. I conclude that ITIL is more effective on the process level and COBIT is stronger in area of IT governance. COBIT is more used in North-America and ITIL is used world-wide. Therefore, all of my researched organisations used ITIL instead of COBIT. ITIL, IT frameworks and IT risk frameworks are the basis of the architecture planning capability. The architecture planning capability influences the capability of making technology work. A part of the architecture planning is the project management. All large organisations in the sample have clear guidelines and processes for the project management. I concluded from the results that project management is important for the architecture planning capabilities and making technology work. Nevertheless, skilled specialists and architecture planners are needed for the realisation of the IT architecture. The police use external consulters (e.g. IT.NRW) to close knowledge gaps. I also concluded from the results that this is sensible for the police to make up ground in comparison to Telekom or Bertelsmann. In this context the improvement of the effectivity of the internal IT control system is also necessary.

**Making technology work**

The capabilities of business system thinking and IT architecture planning influence the capability of making technology work. The police, Bertelsmann, Telekom and T-systems have all IT processes in accordance with the ITIL. Ruhrpumpen is trying to introduce ITIL at the moment. Good documentation and clear processes as well as unambiguous IT responsibilities are the basis of good and effective IT architecture. These topics are part of the COBIT focus areas of value delivery, risk management and performance management. All organisations stated during their interviews that they have all IT processes documented.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

The police want to achieve the certification 27001/ 27002 for IT security. Bertelsmann, Telekom and T-systems are already certified. Ruhrpumpen is an exception to the other organisations which all have CISO for all locations. This shows how important IT security is for all these organisations. Furthermore, they train their emergency plans in accordance to their risk frameworks. These organisations also have a process for continuous IT optimisations. Bertelsmann as well as Telekom and T-systems sometimes have the problem that IT development is faster than IT process and IT security management. Ruhrpumpen knows the problem but their IT is still driven by business.

This leads to the low value of IT optimisation and IT security in this organisation. The CEO of Ruhrpumpen said that their owner is unsatisfied with their IT because there are deficits in their IT performance, IT security and IT costs. Bertelsmann as well as Telekom and T-Systems responded that they are satisfied with their IT. They agree that their IT is secure, robust and overall user-friendly. The police organisations sometimes have service quantity problems along with downtimes of their IT systems. Although they have had some security breaks in the past (e.g. several weeks downtime of the main IT application IGVP or the hacked internet website police.nrw.de), is the police are mowing in the right direction for improving their IT.

The systems of the police are secure and robust but sometimes they are not user-friendly. Telekom and T-systems as well as Bertelsmann have a full program of backup data lines, backup systems and also backup datacentre. The police force has back up lines and backup systems too, but no backup datacentres due to the accompanying high costs. They have already moved a part of their server to IT.NRW and in return they closed one of their datacentres. These organisations do everything possible to achieve performance of their IT infrastructure. In contrast, their primary focus for Ruhrpumpen lay on cost optimisation. This topic also belongs to the COBIT of focus area risk management. A further important topic in this chapter is project management. This belongs to the COBIT focus area of value delivery. Telekom, T-Systems and Bertelsmann revealed in their interviews that less than 20% of all projects are not realised.
They mentioned that these projects did not fail because of the technical problems, but rather due to cost problems or difficult market conditions. In the police force 20% of all projects are not realised with the planned costs or do not have the required functionalities. Ruhrpumpen needs several attempts to realise their projects. More than 20% of the projects fail because of increasing costs or technical problems. A low level of failed projects is an indicator of high capabilities of making technology work and architecture planning. All organisations in the sample have contracts with service providers for the fast assistance in the case of problems. The police force, Bertelsmann, Telekom and T-Systems manage the first and second level support with their own specialists.

They have service contacts with all important software and hardware manufacturers to use external specialists as the third level support. The capability that makes technology work belongs to the COBIT focus areas value delivery, risk management and performance management. I concluded from the results that skilled specialists are important to realise projects, administrate systems or solve problems.

The police can learn from large companies and service providers to increase the quality of service and IT security. Telekom is now the main provider for the police in several large projects, e.g. for VIVA, a replacement for the main application of the police IGVP.

Furthermore, a good IT architecture in accordance with the ITIL is also important for large organisations and the police. In the future the introduction of COBIT in combination with ITIL and the police’s own frameworks is sensible. BSI, ITIL and ISO 27001 are frameworks and standards to improve the effectiveness of an organisation’s IT environment. The results of my research underpin the results of Huang et al. (2009) and Krisanthi et al. (2014) that all organisations combine different frameworks and standards (e.g. ITIL, BSI and ISO 27001) in order to optimise and standardise their IT environment. In this context, the improvement of the effectivity of the internal IT control system is also necessary.
Informed buying

Except for Ruhrpumpen, all organisations interviewed define service levels for internal and external services. The LZPD and IT.NRW are internal service providers and have a wide range of different internal and external service levels. Only the police authorities do not handle the service level management strictly. Telekom and T-Systems as well as Bertelsmann have thousands of internal and external service levels. This topic belongs to the COBIT focus area of value delivery. But the capability of informed buying also belongs to the COBIT focus area of resource management. All organisations analyse the market conditions and products to get a feeling of which services or products fits optimally with their organisation. Here the question is: What service is needed? What is possibly? What is the price of the different sellers? The police force has to call for tenders and there are strict laws for tendering in the public service. This concept is really inflexible. In the case that they have chosen the wrong provider, they cannot easily choose a new provider. They have to call again for tenders and have to choose the cheapest offer which is normally the lowest quality or has not the needed functionalities. The police have always to take cheapest offer if the bidders fulfil all tender requirements (§55, LHO (state’s budget guidelines), 2018). There are in rare cases exclusions if one bidder is not fulfilling the tender requirements. For example, the police changed the terms of tender to exclude the network component producer Huawei from the tender process. However, the police feared that the Chinese switch components have integrated spyware. In the normal case Huawei would have won the tender because they fulfilled all requirements and made the best offer. (Project manager CN-POL NG from the LZPD, 2018)

Private companies such as Bertelsmann or Telekom and T-Systems call for tenders too, but they can freely choose the best offer and are flexible changing the provider in the case of problems. However, they can calculate their costs for several years and invest more in one year than in another. This is in contrast to the cost calculation in the police force. The police force cannot make debts and they are forced to invest as much as in the received yearly state’s household budget.
This is the main difference between the public service and private companies. It is obvious the police force is handicapped in the resource management due to the strict budget and the strict laws for tendering. This could also explain the higher rate of failed IT projects in comparison with Telekom and T-Systems as well as Bertelsmann. With a lower technology innovation rate Ruhrpumpen has no internal and external service levels, but the CEO said that they want to introduce them. Ruhrpumpen also does informed buying which is strictly regulated by the owner. That is also inflexible and leads to a high failure rate of IT projects and IT services. However, the main weaknesses of tendering for the police force is the law to tender Europe-wide and the law to take the cheapest offer. This is a political problem that cannot be solved by the police. I concluded from the research that administrative employees develop the tenders without the continuous assistance of technicians. This could be a reason for later service problems. Therefore, the police force should improve its relationship building and communication capabilities. In this context the improvement of the effectivity of the internal IT control system is also necessary.

Contract facilitation
The contract facilitation capability belongs to the COBIT focus area of resource management. Ruhrpumpen has no real service level agreements or does contract facilitation because in the past it was not necessary. Bertelsmann as well as Telekom and T-systems have good contract facilitation because they also work as a service provider. They have thousands of different service level agreements. For this reason, they developed large departments for contract facilitation. They also have internal service level agreements to manage the quality of service and the calculation of costs. Therefore, they are able to compare the costs for internal services with the costs of external services. The police force has often problems with their contract facilitation because, due to bad contracts, they have been cheated by the service providers. In the worst case the police changed the provider.
An example of this is the support contract for network components from Avaja. In accordance with the states’ LHO standard, the states have clear guidelines for the supply. Bertelsmann, as well as Telekom and T-systems, also has clear guidelines for resource management. Furthermore, they have a clear resource management process. Bertelsmann has sometimes an overrun of IT budget and IT costs. Telekom and T-Systems do not have an overrun of IT costs but occasionally have an overrun of IT project costs. The police have no overrun of IT budgets because they cannot make debts.

Ruhrpumpen has no overrun of IT costs due to its cost optimisation strategy and the regulation by the owner. Good contract facilitation avoids additional costs that could lead to an overrun of an IT budget. All of the large organisations except Ruhrpumpen have an internal control system that manages the contract facilitation and contract monitoring.

The research showed that the police force cannot avoid the problem of tendering but it can be more aggressive in its fight for its rights. Companies know that the civil service is slow and too good-natured in business things and the companies misuse this weakness. Furthermore, the police should prove its contracts more efficiently in the future. I concluded from the research that administrative employees develop the contracts without the continuous assistance of technicians. This could be a reason for later service problems. Therefore, the police force should improve its relationship building and communication capabilities.

Contract Monitoring

This capability fits to the contract facilitation capability. However, this capability belongs to the COBIT focus areas of resource management and performance management. The internal IT control system monitors the fulfilment of service levels, aims and goals. It benchmarks the service providers and suppliers and measure the IT efficiency and IT profitability. The police authorities have no internal IT control system and no service level monitoring.
The LZPD is monitoring internal service level and also external service level. Furthermore, the LZPD has also an internal control system and it is benchmarking performance and quality of IT services. The MIK also has an internal control system and it is benchmarking the police’s IT aims and efficiency. However the MIK and LZPD also have processes for project acceptance. The collected data is the basis for the yearly IT optimisation process. There are also regular meetings of LZPD, MIK and authorities for speaking about problems and IT projects. This can be compared with the relationship between customers and the IT service provider manager.

Telekom and T-systems have high skills when it comes to contract monitoring because they offer IT services to many customers. They benchmark and report the internal and external service levels of their providers and suppliers. Furthermore, they measure the IT efficiency and IT profitability and also have a very effective internal control system. This is also the reason why they are benchmarking units for competitors in the various markets. They also have regular meetings with managers and customers. The complete data is the basis for their yearly IT optimisation process. There are regular meetings of customer managers with customers at Bertelsmann and in combination with the fast escalation process possible problems can be solved quickly.

The company measures IT efficiency and profitability and it uses the program ECO Finance to check its aims. Furthermore, Bertelsmann has an effective IT control system for the whole company and its various divisions. In contrast, Ruhrpumpen does not have contract facilitation, benchmarking of service provider and also does not have an IT optimisation process. The Ruhrpumpen managers use their gut feeling to measure performance and IT success. The comparisons of the different organisations have shown that the police, Bertelsmann, Telekom and T-Systems have a lot of similarities concerning contract monitoring. It is the right strategy to have a regular customer meeting in combination with an effective escalation system. The benchmarking and reporting of internal and external services to measure the fulfilment of the SLAs is necessary for effective IT in large organisations. All large organisations have an effective internal control system and use the collected data for their yearly IT optimisation process.
I concluded from the results that low informed buying and contract facilitation capabilities also influence the contract monitoring capability. Therefore, the police force should improve its relationship building and communication capabilities. The police needs a more effective communication of technicians and administrative employees.

**Vendor development**

Telekom, T-systems and Bertelsmann want to reduce the supplier numbers and establish a network of preferred value suppliers and providers. The police cannot freely choose their providers and suppliers because they have to follow their tenders. Ruhrpumpen managers choose their suppliers providers intuitively: if they had a good experience with a supplier they use him again. Large organisations rarely develop a special relationship with their suppliers and service providers because they have too many. Vendor development belongs to the COBIT focus areas of resource management and performance measurements. This capability is influenced by the capabilities of informed buying, contract facilitation and contract monitoring. Deficits in these capabilities will also cause problems in vendor development.

I concluded that the police can learn the vendor management from large companies. The results of the study by Kakabadse and Kakabadse (2001) are vital to my present study for comparing the IT outsourcing strategies of private companies and public service. Outsourcing strategies of private companies are transferable to the public service. The positive and negative aspects of outsourcing in this study corroborate the results of the literature review. I conclude that the results highlight the importance of finding the right outsourcing strategy with a suitable provider.

Willcocks and Currie (1997) termed that as “right sourcing”. Therefore, the police should also learn from the private sector to develop capabilities needed to undertake a successful outsourcing strategy. The first step is a strategic alliance, e.g., using the Microsoft’s services as the main supplier and using the Telekom to program Viva, the police’s major software application and as a server supplier.
Public services have guidelines for the interaction between providers and suppliers, e.g., civil servants are not allowed to accept presents with a value over 5 Euro. Even at business lunches they pay for themselves. The aim is to prevent bribery and to develop an objective rational relationship with providers and suppliers. The provider management by Bertelsmann, Telekom and T-systems’ effective benchmarking of suppliers and providers is a good basis for strategic alliances with providers and suppliers and a preferred supplier and provider system.

Staff and knowledge development

Ruhrpumpen do not have a staff development programme of IT specialists because they hire IT specialists from the free market who are trained in external training centres. In contrast, the police train their own IT-specialists at training centres at LAFP, IT.NRW and external service providers. Some authorities have their own IT apprentices. North-Rhine-Westphalia (NRW) has a university of applied sciences for their employees and civil servants, but this university has no computer science course, even though academic IT specialists are urgently required. The state NRW previously tried to established study courses for IT specialists, but this was attempted with internal staff and poor results meant that this programme was not repeated.

The police have had problems to find IT specialists and therefore many policemen and employees without any technical expertise filled these roles. Bertelsmann, Telekom and T-systems have a university programme along with an apprentice system to educate IT specialists; therefore, they can hire their own highly trained IT specialists. I conclude that the state NRW should also establish a university education system for IT specialists and the apprentice system should be improved. A further problem is the reduction of the salaries for employees in 2005 with introduction of the labour agreement (TVOED).

In private companies IT specialists have the chance of higher salaries and for IT specialists with a study degree the public service is unattractive. The state NRW should make the public service more attractive for IT specialists with a study degree.
Project management

Ruhrpumpen has major problems in successfully finishing their IT projects and over 20% of all IT projects fail. The projects for migrating their Ban Construction software to a new system failed several times during the years, despite receiving help from external specialists. In contrast, Bertelsmann, Telekom and T-Systems all have a project success rate of over 80%, although they occasionally overrun their IT project budgets. These companies also offer their IT services to external customers, and completing projects is part of their business model. When faced with large and insoluble problems, they close the projects very quickly. The police are currently not able to complete large projects within the planned time, budget and functionality requirements. Good examples include the VIWA project, the digital police radio or the CN-Pol next generation project (bandwidth upgrade of all data lines within the police network).

The NRW police cannot exceed its budget, so if a project requires more resources, the budgets for all other IT projects shrink. The problems introducing of the MoWin (modernisation Windows) project meant that many other projects could not be completed due to transfer of essential resources. Furthermore, I concluded that the projects failure rate shows the efficiency of the entire IT organisation. The police should learn from private companies how to manage projects successfully. The results of the study by Kakabadse and Kakabadse (2001) are vital to my present study for comparing the IT outsourcing strategies of private companies and public service, therefore, the strategies from Bertelsmann, Telekom and T-Systems are transferable to the police. However, even though the VIWA program was programmed by T-Systems, and it still failed to meet the planned time, budget and functionality requirements. The digital police radio and CN-Pol next generation projects fared similarly. These examples proved the old outsourcing rule: You cannot outsource your problems. The police must also increase their project management skills and learn how to manage their service providers.
13.4. Status of core IT capabilities in the NRW police

Business and IT vision

- (+) Business Systems Thinking
- (+++) IS/IT Governance
- (-) Informed Buying
- (-) Contract Facilitation
- (-) Vendor Development
- (0) Architecture Planning
- (0) Relationship Building
- (-) Making Technology Work
- (0) Contract Monitoring
- Delivery of IT services

Figure 57: Final assessment of core IT capabilities in the police NRW (adapted from Willcocks et al., 2007)

13.5. Core IT capabilities in the COBIT IT governance cycle

The capabilities contract monitoring and contract facilitation could be mapped to the COBIT focus areas value delivery resource management and performance management. I found out that these capabilities have large optimisation potential, especially for the police.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

The capability vendor development belongs to the COBIT focus areas performance measurement and resource management. The capability IT governance is only part of the COBIT focus area strategic alignment. I used the conceptual framework of Lacity and Willcocks (2001) in the literature review. At the end of the research I developed an adapted research model based on valid data. I sorted the core IT capabilities in the COBIT IT governance cycle. The following diagram illustrates the adapted research model including the core capabilities from Lacity and Willcocks (2001) and those I concluded from the research results.

I concluded that the capability relationship building and communication are important for all five IT governance focus areas. In contrast to Lacity and Willcocks (2001), I thought that the capabilities architecture planning, making and technology work belong to the COBIT focus areas value delivery, risk management and performance management. Furthermore, the capability business systems thinking is included in the COBIT focus areas strategic alignment, value delivery and risk management. I viewed staff and knowledge development and project management as internal own core IT capabilities. This is in contrast to Lacity and Willcocks (2001) who defined them separately from their framework under the skills category. Willcocks et al. (2014) called project management programme management and staff management behaviour (people) management but the meaning of these capabilities are identical. Therefore, I used Willcocks et al.’s (2014) key provider capabilities to support my research.

The LZPD is not only the client for service providers and the suppliers, but is also the only internal service provider for all police authorities in NRW. Furthermore, I conclude that the key provider capabilities of programme management and behaviour (people) management are important for the police. However, I would assert that staff and knowledge management are important capabilities which fall under the resource management COBIT focus area. I would argue that employees have special skills due to their knowledge, education, and experience, all of which fall under staff and knowledge management. The project management capability falls under the COBIT focus areas value delivery, risk management and resource management. The changes between the current research model and the research model from chapter 3 are marked in green.
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

Thesis from Uwe Blind

Figure 58: Adapted research model with core capabilities to exploit IT in the COBIT IT governance cycle
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?
Thesis from Uwe Blind

13.6. Final adapted IT governance cycle for the police
The following diagram is based on the valid research data and comprises of suggestions for improvements in the five focus areas of the COBIT IT governance cycle.

**Strategic alignment**
- no further optimisation of IT strategy necessary
- stronger influence of IT.NRW could be helpful
- introduction of flat hierarchies
- communication between IT and business can be improved

**Value delivery**
- communication between IT and business can be improved
- project management is improvable
- Improvement of tendering, contract monitoring and contract facilitation
- stronger use IT.NRW services
- quality of service and IT security can be improved
- improvement of internal controlling

**Risk management**
- communication between IT and business can be improved
- quality of service and IT security can be improved
- project management can be improved
- stronger use IT.NRW’s services
- use COBIT in combination with ITIL and the NRW’s IT frameworks
- achievement of ISO 27001/27002

**Performance measurement**
- communication between IT and business can be improved
- quality of service and IT security can be improved
- Improvement of tendering, contract monitoring and contract facilitation
- vendor development can be improved
- improvement of performance measurements
- service provider monitoring is improvable

**Resource management**
- communication between IT and business can be improved
- staff and knowledge development can be improved
- make public service more attractive
- Improvement of tendering, contract monitoring and contract facilitation
- vendor development can be improved
- project management is improvable
- fixed IT budgets are not future-proof therefore, a political solution necessary

Figure 59: Final, adapted IT governance cycle for the police

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14. Conclusions

14.1. Overview of the research

The research question was to determine whether the IT governance and IT outsourcing strategies of large private companies would be practical for the NRW police and how do they differ. IT governance is part of governance, while IT outsourcing is a strategy which falls under IT governance. In the chapters before I described how governance works in private companies and in public services. The literature review identified case studies about IT outsourcing in large companies but no literature could be found about IT outsourcing in the public service. A previous trend was to try and find the Holy Grail of IT outsourcing, with large consulting companies developing strategies and concepts for the optimal outsourcing. But today’s companies want to find the right IT sourcing strategy. The police tried to introduce concepts and strategies adapted from consulting companies. The aim of the current research was to collect data from interviews with members of the police and large companies.

The main intent was to find an IT company (T-systems and Telekom), a multimedia media company like Bertelsmann and a company from the producing sector (Ruhrpumpen). This research aimed to discover how large companies manage IT governance and IT outsourcing compared to the NRW police. This partly involved identifying of the current outsourcing situation. A further step was to develop an IT governance cycle for each organisation in accordance with the COBIT framework and IT governance focus areas: strategic alignment, resource management, value management and performance management. The next step was to identify IT capabilities in large organisations in accordance with Lacity and Willcocks theory of nine core IT capabilities. In the final step, these capabilities were mapped in the COBIT focus areas to develop an IT governance model which could be adapted for the police force.
An intermediate goal was to find a company with a total insourcing strategy (Bertelsmann) and a company with a total outsourcing strategy (Telekom). Similarly, it was necessary to find a large company with a poor IT architecture (Ruhrpumpen), to compare with the others in the sample. Obtaining the right sample was essential to ensure a broad overview of large companies. Initially, the research question concerned whether large companies’ IT outsourcing strategies are feasible for public services, using the police as an example.

Ultimately, the term “IT outsourcing” was replaced with “right sourcing”, based on the research by Lacity and Willcocks (2001). For this research I used an exploratory strategy based on analytical techniques and procedures. The research was strongly influenced by Yin’s (2009) case study methodology. After the classical literature review the research framework was created. The next step was to develop a questionnaire for the interview that was tested in a pilot study. Subsequently, a multi-case study was conducted with interviews with members of the police, the MIK and private companies. The results of the individual case studies were analysed separately and were compared with each other via cross-case analysis. These results formed the basis of the adapted conceptual framework. I used data from secondary sources from the literature review (websites, books and databases) for the case studies. In the interviews, I collected data from among primary sources of the top management from the various organisations. Notes were taken during the interviews and the respondents were contacted later for follow up questions.

An important goal was to identify the current IT outsourcing situation in the organisation and their overall outsourcing success. A concept was adapted from Grover et al. (1996) to classify IT outsourcing success in terms of strategic, economic and technical benefits. I also attempted to prove Moore’s (1995, 2011) theory of creating public value, as public service organisation function differently and have different goals from private companies. Ultimately, a COBIT IT governance model for the police was developed.
14.2. Contributions of the research

14.2.1. Results of the case NRW police

The state of NRW has expended considerable financial and material resources improving the IT of its police in recent years. When I started my research in 2009, I thought the police force's IT setup had more weaknesses than those found in large private organisations. However, the research results were not as clear as expected, because the police force has made up ground in this area over the last decade, even becoming more developed than large organisations in some areas. The research contributions will be listed here in brief but more detail can be found in the following sections.

I concluded from my research that the IT strategy of centralising IT at LZPD and outsourcing to IT.NRW is sensible and needs no further optimisation. The police should introduce flat hierarchies in their IT and should optimise communication between all business units throughout all focus areas of the IT governance cycle. The police have established strong IT security over the past decade but this can be still improved by meeting of ISO 27001/ 27002 requirements and improving the quality of services. The second largest problem faced by the police is the lack of skilled academic IT specialists due to unattractive remuneration. The salaries and training of the IT staff must be improved. I found that the largest problem in the police is the fixed IT budget and its use. In particular, the tendering, contract monitoring and contract facilitation procedures have to be improved. Therefore, it is also necessary to replace the policemen in these areas with highly skilled academics.

The present study shows that the problems with project management and the management of vendors and service providers are critical. The police should learn from private companies like Bertelsmann, Telekom and T-Systems, which are more professional in these areas. The police should work on these problems; the MIK has already started optimising these fields, e.g., introducing an effective software licence management, implementing new project guidelines and employing skilled specialists for contract management and facilitation.
The police have to enforce their needs and rights or the vendors and service providers will take advantage. Ultimately, the police should also improve its core IT capabilities, as described in chapter 14.5.

14.2.2. Connections between the literature and the results

I found that Moore’s theory of public value (1995, 2011) could not be proven by police results. A centralisation strategy with hardware and software standardisation and centralised supply weakens the influence and freedom of decision of local IT managers as well as the managerial authority of the authorities. Local IT managers and their IT departments will disappear in the coming years. BSI, ITIL and ISO 27001 are frameworks and standards to improve the effectiveness of an organisation’s IT environment. The results of my research underpin the results of Huang et al. (2009) and Krisanthi et al. (2014) that all organisations combine different frameworks and standards (e.g. ITIL, BSI and ISO 27001) in order to optimise and standardise their IT environment. I conclude that ITIL is more effective on the process level and COBIT is stronger in area of IT governance. COBIT is more used in North-America and ITIL is used world-wide. Therefore, all of my researched organisations used ITIL instead of COBIT.

The results of Lacity and Willcocks (2014) study close the gap in my research because standardisation, centralisation, optimisation and automation are common trends in the IT; however these results were not supported by theory in the past. In the current study, I found that Lacity and Willcocks (2014) transformation levers (centralisation, standardisation, optimisation, technology enablement and labour transfer to low-cost location) were achieved at Bertelsmann, Telekom and T-Systems. Bertelsmann, Telekom and T-Systems achieve high levels of implementation in this way; they also have good IT governance in this area and a highly effective IT environment. My research results support Lacity and Willcocks’ (2014) theory that standardisation, centralisation, optimisation and technology enablement in the IT optimise an organisation’s entire IT environment of Bertelsmann, the police, Telekom and T-Systems.
It is obvious that the companies followed the standardisation, centralisation and optimisation trends in the IT for more than a decade and Lacity and Willcocks (2014) developed a theory based on these researched phenomena. The selective outsourcing strategy with short-term contracts with several service providers in combination with an internal service provider was a successful strategy for the police, Bertelsmann, Telekom and T-Systems. My results proved Willcocks and Curie’s (1997) theory that all researched organisations use the selective outsourcing strategy because the full outsourcing strategy is too risky and unsuccessful. I also proved Willcocks and Curie’s results that centralisation to an internal service provider and selective outsourcing to several service providers on the basis of relatively short-term contracts successfully improved flexibility, reduced costs, and optimised quality of services and control over the IT activities in a fast changing environment. My study shows that the internal service providers in the subject organisations are cheaper and better and this is often not considered in outsourcing decisions. This is also the reason why the service provider T-Systems has problems with the profitability of its business model.

The results of the study by Kakabadse and Kakabadse (2001) are vital to my present study for comparing the IT outsourcing strategies of private companies and public service. The IT sourcing strategies of Bertelsmann, Telekom and T-Systems are transferable to the police. The positive and negative aspects of outsourcing in this study corroborate the results of the literature review. I also follow Kakabadse and Kakabadse’s (2001) opinion that the outsourcing of unnecessary and non-critical services and processes had strong influences on the public service efficiency. My research also shows that there is no guarantee that the police would find the outsourcing strategy beneficial and it also could minimise its effectiveness. Although outsourcing is a political decision it still leads to disillusionment among the public service.

I conclude that the results highlight the importance of finding the right outsourcing strategy with a suitable provider. Willcocks and Currie (1997) termed that as “right sourcing”. The police should also learn from the private sector to develop capabilities needed to undertake a successful outsourcing strategy.
14.2.3. Conclusions from the final comparison of the organisations

I found that the police still have problems with allocating their fixed IT budget and overcoming the bad tender process but they benefit more from outsourcing than do private companies. The police modernised its IT with the help of the internal service providers LZPD and IT.NRW. Currently, LanFin, the state’s finance authority, introduced and supervised the SAP accounting software during the Project EPOS (EPOS Project group, 2018).

In several cases the police needs help from external specialists. Without the assistance, the IT services of the police could not be modernised in such a short time. However, I concluded from my results that the benefits of IT outsourcing far outdo the problems with some service providers or the bad tenders. In comparison, Telekom’s problem child T-Systems suffered because of an unprofitable business model. The T-Systems offers the classical desktop support to too many customers and companies find it cheaper to do these tasks using own staff. Currently, a larger customer Thyssen-Krupp sourced back all services from T-Systems (FAZ, 2018). Therefore, the T-Systems loses customers and tries to work more profitably by cutting jobs and restructuring their service portfolio.

Bertelsmann is not successful in outsourcing because they are have outsourced less than 10% of their IT. The company is not yet ready for outsourcing and is still in the internal restructuring phase to enable outsourcing. Bertelsmann has still larger enterprises, for example Random House, which is still not completely integrated in the companies IT although it was acquired 20 years ago. The company forces a decentralisation strategy with flexible independent units making outsourcing even more difficult. Bertelsmann and Telekom do not enjoy the benefits of outsourcing, but they nevertheless are very successful in the market. The IT governance cycles of Bertelsmann, Telekom and T-Systems show that they have good IT governance and have developed high core IT capabilities. The police have weaker IT governance and could learn from these companies. I conclude that companies could have good IT governance and high core IT capabilities even if they are not benefiting fully from IT outsourcing.
The first steps according to Lacity and Willcocks (2014) could be enough to develop a highly efficient back office. In the case of the police, IT outsourcing benefits are higher than the problems but the police have to improve its IT governance and their core IT capabilities. The oil pump manufacturer Ruhrpumpen has bad IT governance and low core IT capabilities and it has not realised all IT outsourcing benefits but the company is very successful in the market. Most often production companies in an oligopoly market concentrate on their core business and have a weak IT and a messy back office. In these cases good products compensate all other problems in a company (Lacity and Willcocks, 2014).

14.3. Research results compared with the new IT strategy 2020

In November 2016, the NRW police published the new IT strategy paper for the next five years which corroborated most of the results of my research. In the following the aims are explained. Previously, the police defined itself as an authority tasked serving and protecting the citizens. However, The NRW police now define itself as a 50000 employee customer-orientated company which aims provide a high quality service to citizens. The police have adopted the strategy of centralising IT to the LZPD and outsourcing strategy to IT.NRW. In addition, the police have developed an application portfolio management which includes all centralised IT applications. Equipment can be ordered from a central supply pool.

The MIK requires a better contract facilitation and monitoring to overcome the major problems with vendors and service providers. New controlling units and now controlling systems should resolve this. The police have realised that computer specialists with bachelor and master degrees cannot be hired at the current wage level. Therefore, changed the paradigm and will develop the policemen's IT skills. In the future, more specialists will be hired or trained for process and method development. Further aims include modernising the IT infrastructure, big data management, higher IT security and mobile device support.
This list shows that I identified the correct problems within the NRW police and as the MIK come to the same conclusions. My research determined that the LZPD cannot solve all current IT problems internally as they are too extensive. The LZPD has established regional IT centres in the police presidiums with IT specialists to react faster to problems in the authorities. These regional IT centres already support digital police radio, and the plan is to establish a backup data centre in the IT.NRW datacentre in Hagen. Finally, I concluded from the IT strategy 2020 that the current centralisation and outsourcing strategy is successful because the MIK is still following its strategy.

14.4. Contributions of IT sourcing in the police

The results obtained from the interviews with IT managers of the police were similar, increasing the validity of the data. The police ranking in all categories is good in comparison with private companies. The current situation in the police is an IT centralisation strategy at the internal service provider LZPD. In the near future the SG 31 IT departments in the police authorities will disappear and IT tasks are further centralised at the LZPD. An IT centralisation at an internal service provider is only a prior step for the out-tasking to the states internal service provider IT.NRW.

The results are underpinned by the results from Bertelsmann, Telekom and T-Systems, which also centralised their IT at an internal service provider. Telekom outsourced large parts to their daughter company T-Systems. Ruhrpumpen too tried to centralise IT at the headquarters. I concluded from my research that the police have the right strategy to unlock economic, strategic and technical advantages. The police data are coherent and valid due to the similar results from the three police authorities. However, I only saw the inability of the police to reduce the IT staff in the police more radically as a problem for the public service. Several thousand employees and civil servants from authorities in NRW that were centralised or closed, e.g., environment agencies, still need to be reallocated. The unions and staff councils at the police authorities are very powerful in Germany and they will not accept a radical reduction of IT in the authorities.
In the migration project from Windows XP to Windows 8 the project manager advised the authorities that several hundred IT specialists in the authorities would be no longer needed. The authorities complained to the MIK, resulting that the project management being replaced. The MIK promised that there will be no radical cuts of IT jobs (information from an IT specialists meeting in Muenster on the 28th April 2015).

The police want to concentrate on its core business and reduce public administration in the authorities. In recent years the police performed several optimisations that facilitated IT centralisation: standardisation of hardware and software, a reduction in the number of software applications and the establishment of a centralised supply.

This trend has also been proven by the results obtained by Bertelsmann, Telekom and T-systems, companies have an optimisation strategy to reduce costs and staff while improving the IT architecture and quality of service. In this sample Telekom has the highest hardware- and software optimisation and a centralised supply. I concluded that the police tried to learn from this company, but due to current problems with the last server supply the police want to get rid of the Telekom as a service provider for servers (the police had used servers from Siemens-Fujitsu for several decades before changing Hewlett Packard servers from Telekom).

The current results show that the police’s IT is now more effective and has lower costs than before the centralisation. Furthermore, the authorities still want to paddle their own canoe and try to manipulate direct orders of the minister. As already mentioned, the authorities previously successfully prevented a radical cut in IT jobs. However, this will cause further potential for conflicts in the future. Even the Minister of the Interior does not want an open conflict with the police staff councils and unions. The political aim is to transfer many IT tasks to IT.NRW, but the police don’t want to lose large parts of their influence and freedom of decision. IT.NRW had planned to introduce the new Windows 8 and Windows server 2012 at the police with the primary focus on reducing local staff and weakening the LZPD. The top management of the LZPD successfully prevented this and conducted the project with its own IT specialists.
I concluded that in future IT.NRW will increasingly take over IT tasks of the LZPD because this is not only a political decision but also logical and reasoned, and the next in progressing further optimisation. IT.NRW provides already a good service quality to many other authorities, e.g., the Ministry of Justice and Strassen.NRW.

14.5. Core IT capabilities in the police

IT governance/leadership

The IT governance capabilities are an effective driver for successful IT governance in an organisation (Lacity and Willcocks, 2001). The police use a long-term, five-year IT strategy and a development route or strategic milestone that could be classified as a short-term IT strategy. High capabilities of IT governance are necessary to define the right IT goals and strategies. The most important topic in IT governance is a clearly communicated IT strategy. During my research the police migrated systems very slowly because the period between migrations of the desktop operating system from Windows XP to Windows 8 was more than seven years. The police want to establish new solutions more quickly in future. IT changed strategy from a late technological follower to a technological follower or an early adapter. As mentioned in the previous chapter, the police use effective IT centralisation and outsourcing strategies, strategies also used by other large companies. Furthermore, I concluded that the current IT strategy is coherent and needs no further optimisations. A great advantage is the strong influence of IT.NRW that also provides high service quality and the required technical knowledge. The police have developed high capabilities in IT governance in the last decade.
Relationship building (communication)
Lacity and Willcocks (2001) defined the capability relationship building and communication as an important driver of an effective IT. Large companies like Bertelsmann, Telekom and T-systems have very effective communication. Relationship building and communication are important for the whole IT governance cycle. The police have the problem that the communication between IT departments and other departments in the public service has large optimisation potential. Information exchange between IT.NRW and the LZPD and between the LZPD and the authorities has to be improved in the near future.

The LZPD could learn from large companies how to work as a customer orientated service provider. In the past the LZPD makes up ground in this field. But high capabilities in this field require clear flat hierarchies, clear responsibilities and fast information exchange. This means the police have to become more customer orientated and achieve faster information exchange and flat hierarchies.

Business systems thinking (process management)
Lacity and Willcocks (2001) define high capabilities of business systems thinking and process management as essential drivers of effective IT particularly in the COBIT focus areas risk management, strategic alignment and performance management. The results from the interviews show similar business systems thinking and process management in large organisations. The main reason is that the authorities defined their processes in accordance with the ITIL. This capability also influences the capabilities architecture planning and making technology work. The police use the state’s own IT frameworks and risk frameworks in combination with the ITIL also the large companies use a similar framework. The annual IT optimisation process is also important in developing these capabilities. I concluded that the police force has done well because it developed high capabilities in this area.
Architecture Planning

An IT architect designs the infrastructure from the organisation’s business strategy and IT strategy, taking into consideration the core business and technical and economical possibilities (Lacity and Willcocks, 2001). The MIK and the police force have a five-year IT strategy and want to reach strategic milestones. The police authorities have a centralisation strategy at the LZPD. The LZPD has an out-tasking strategy to IT.NRW. All of the interviewed organisations already have or want to centralise IT at internal service providers, while they also enforce an out-tasking strategy of smaller parts of the IT organisation. At the moment the police force is a late technological follower because it is very dependent on IT.

All interviewed organisations have already implemented or want to introduce a continuous IT standardisation and IT optimisation strategy. Bertelsmann, Telekom and T-Systems have the ISO 27001/27002 certification for IT security. The police follow these as well as the BSI guidelines. All interviewed organisations except for Ruhrpumpen use ITIL best practise processes in combination with their own frameworks. The introduction of COBIT in combination with ITIL and the police’s own frameworks would be sensible in future. All interviewed organisations have clear guidelines and processes for the project management. The police use external consultants (e.g., IT.NRW) to close knowledge gaps because this makes sense for the police to make up ground in comparison to Bertelsmann, Telekom and T-Systems.

Making technology work

Lacity and Willcocks (2001) state that IT managers have to rapidly troubleshoot a problem across the technical supply chain as well as identify business needs and develop suitable solutions. All IT processes of all interviewed organisations have documented and most of them in accordance with the ITIL. Like other large organisations the police force trains emergency plans in accordance with its risk frameworks and has a process for continuous IT optimisations. The systems of the police are secure and robust but sometimes not user-friendly.
The police have backup lines and backup systems too, but no reserve datacentres due to the accompanying high costs. However, the police force has already moved a part of its servers to IT.NRW closing one of its data-centres as a result. 20% of all IT projects in the police are not completed with the planned costs and time or do not have the required functionalities. All large organisations except for Ruhrpumpen have first- and second-level support with their own specialists. All interviewed organisations have service contacts with all important software and hardware manufacturers to use external specialists as the third-level support. The police can learn from large companies and service providers in order to increase the quality of service and IT security.

Although the police force has had some security incidents and IT service quality problems in the past it has the right strategy for improving its IT. The police should achieve the ISO 27001/27002 certification for IT security in the future. The introduction of COBIT in combination with ITIL and the police’s own frameworks would also be sensible. Improving the effectiveness of the internal IT control system is also necessary in this context.

**Informed buying**

Lacity and Willcocks (2001) state that IT managers have to manage tendering; as well as contracting and developing the services. Firstly, IT managers need reassurance that the in-house option is truly comparable with external services. Secondly, where core IT architecture or other operations services are centralised in-house the IT managers need to define internal services with service level agreements (SLA).

Like other large organisations, the LZPD and IT.NRW have a wide range of internal and external service levels with service providers. All interviewed organisations analyse the market conditions and products to get a feel of the services or products that fit optimally with their organisation. The main difference between the police and private companies is that the police force has to call for tenders and there are strict laws for tendering in the public service. This is a very inflexible process because the police have to select the cheapest offer, normally the lowest quality or lacking the required functionalities.
In contrast to private companies, the police are obliged to invest the full amount of the received yearly, state's allocated budget. The main weaknesses of the tendering process for the police force are the requirements to: tender Europe-wide, take the cheapest offer and the state's regulated allocated budget. This is however a political problem that cannot be resolved by the police. Administrative employees develop the tenders without the continuous assistance of technicians; therefore, the police force should improve its relationship building and communication capability.

In the future the police should develop and scrutinise the tenders more carefully. Therefore, it is also necessary to replace the policemen in these areas with highly skilled academics. Improving the effectivity of the internal IT control system is also necessary in this context.

**Contract facilitation**

Lacity and Willcocks (2001) stated that contract facilitation is included in the areas of supply services or products and core business. Contracts and service level agreements (SLAs) for internal and external IT services are necessary. The police force often has problems with its contract facilitation due to being cheated by service providers as a result of bad contracts. In the worst case the police change the provider. The state has clear supply guidelines in its LHO standard. The police cannot overrun its IT budgets because they cannot contract debts. All of the large organisations except for Ruhrpumpen have an internal control system that manages contract facilitation and contract monitoring.

The police force cannot avoid the problem of tendering but it can be more aggressive in fighting for its rights because companies misuse its weaknesses of slowness and lenience. Furthermore, the police should develop and scrutinise its contracts more efficiently in the future. In the police force, administrative employees develop the contracts without the continuous assistance of technicians. Therefore, it is also necessary to replace the policemen in these areas with highly skilled academics. Ultimately, the police force should improve its relationship building and communication capabilities. Improving the effectivity of the internal IT control system is also necessary in this context.
Contract monitoring

According to Lacity and Willcocks (2001), contract monitoring both forces the supplier to meet the service level agreements and develops performance standards for the service market. The police authorities have no internal IT control system and no service level monitoring. The LZPD monitors both internal and external service levels and furthermore, has an internal control system and benchmarks the performance and quality of IT services. The MIK also has an internal control system that benchmarks the police’s IT aims and efficiency. However, the MIK and LZPD also have processes for project acceptance.

All collected data is the basis for the yearly IT optimisation process. The research shows the importance of the regular IT meetings of the LZPD, MIK and authorities. The strategy of regular customer meetings in combination with an effective escalation system is sensible for the police. The benchmarking and reporting of internal and external services to measure SLA fulfilment is necessary for effective IT in large organisations. All large organisations have an effective internal control system and use the collected data for their yearly IT optimisation process. The police needs more effective communication between technicians and administrative employees but are moving in the right direction. Therefore, it is also necessary to replace the policemen in these areas with highly skilled academics. Improving the effectivity of the internal IT control system is also necessary in this context.

Vendor development

Lacity and Willcocks (2001) defined vendor development as identifying the potential added value of IT suppliers and providers. The police force cannot freely choose its providers and suppliers because it has to submit to its tenders. However, the police can learn vendor management from large companies. The first step is to form a strategic alliance, e.g., using the Microsoft as the major software supplier and using the Telekom to program VIVA (the police’s major software application) and as a server supplier.
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The public service has guidelines for interaction between providers and suppliers. The police should improve the benchmarking of suppliers and providers and build up strategic alliances with providers and suppliers, and also establish a preferred supplier and provider system. Therefore, it is also necessary to replace the policemen in these areas with highly skilled academics.

**Staff and knowledge development**

Lacity and Willcocks (2001) state that high business skills influence the capabilities of IT governance, business systems thinking, informed buying and vendor development. Strong capabilities in business IT relationship building, designing technical architecture and making technology work are vital to technical success. I found that staff development and knowledge management are important capabilities that fall under the COBIT focus area resource management. The police force trains its own IT specialists at training centres at LAFP, IT.NRW and external service providers. The police have had problems finding IT specialists and therefore, many policemen and employees lacking the required technical expertise filled these roles. I concluded that the state NRW should also establish a university education system for IT specialists while improving the apprentice system. The state NRW should make the public service more attractive to qualified IT specialists.

**Project management**

Lacity and Willcocks (2001) stated that in dynamic business environments have seen a shift in emphasis from hierarchical, functional based organisations to task and project-based operations. The police are currently unable to complete large projects within the planned time, budget and functionality requirements. Good examples include the VIWA project, digital radio project and the CN-Pol next generation project. The NRW police cannot exceed its budget, so if a project requires more resources, the budgets for all other IT projects shrink. I concluded that the project failure rate shows the efficiency of the entire IT organisation.
The police should learn from private companies how to manage projects successfully. Even though the VIWA program is programmed by T-Systems it was still not completed within the stipulated time, budget and functionality requirements. The police must improve their project management skills and learn how to manage their service providers and vendors.

**14.6. Differences of the research with the literature**

According to Moore’s theory (1995, 2011), the public service can create higher public value if local managers in the public service can manage their departments with large enterprising, decision-making power. In the past, authorities in the public services had greater authority to make decisions but often misused their power and ignored direct orders of the Ministry of the Interior. (Chapter 13.2) A centralisation strategy with hardware and software standardisation and centralised supply weakens the influence and freedom of decision of local IT managers and the managerial authority of the authorities. Local IT managers and their IT departments will disappear in the coming years. Current results show that the police force’s IT is now more effective and has lower costs than before the centralisation. It is obvious that Moore’s theory of public value could not be proven by the police results in this context (Chapter 14). Communication in large companies is very important for their efficiency. Willcocks and Lacity (2001) defined this as broader dialogue between business and IT communities. Relationship building improves teamwork between technicians and other members in the organisations (Chapter 13.3).

Lacity and Willcocks (2001) used the terminology capability of relationship building but I think that communication in general belongs to it. Therefore, I used both together as a single capability, although the communication capability is more important for an organisation. In contrast to Lacity and Willcocks (2001) and based on the results, I concluded that project management is important for the capabilities architecture planning and making technology work.
I have also defined project management as a single capability (Chapter 13.3). Lacity and Willcocks (2001) stated that seven out of nine capabilities rely on inter-personal skills for success. They have not defined skills as a single core IT capability. In contrast, I thought that staff and knowledge development are important capabilities which fall under the COBIT focus area resource management. (Chapter 13.3)

14.7. Research limitations

Although this study was carefully planned and conducted there are some limitations. The main weakness is the relative lack of literature about IT sourcing in public services. Therefore, it has not been possible to use contributions from other research studies to compare and validate the current research results. It was not the aim of the research to generalise the findings statistically, but to explore the current IT sourcing situation and capabilities of successful IT governance. A larger sample is clearly necessary to prove any theories, but this was not the aim of the research. I collected data from websites, databases and employees of the various organisations.

It was very difficult to collect primary data from the top management of the various authorities and companies. A general weakness of case studies is that the respondents often want to convey a particular picture of their company. It is possible that various respondents were dishonest in the interviews to conceal unpalatable truths; although I made the experience that the respondents generally said something along the lines of “I am not allowed to give to detailed information about this topic.” In the case of Bertelsmann, Telekom, T-systems and Ruhrpumpen I informally contacted the employees to validate the collected data. I used a concept adapted from Grover et al. (1996) to classify IT outsourcing success in terms of strategic, economic and technical benefits.

The weakness here is that each group has been defined as having the same value, but this was necessary to calculate overall IT outsourcing success. However, the interviews with Telekom and T-Systems showed that only economic benefits are important for these companies.
In contrast, Bertelsmann rates strategic and technical benefits as more important. It was necessary for the comparison of the results to treat all three categories identically. I thought that the size and diversity of the organisation could limit the validity of the research results, but ultimately it transpired that IT in large organisations is very similar making a comparison possible. One reason for this could be that the organisations established their architecture in accordance with the ITIL.

My initial assumption was that the police would have more IT weaknesses and private companies would have a better IT organisation and IT architecture. This would have made it easy to see clearer results but in the recent last years the police have made up ground. The police have now an IT architecture which in some cases is more developed than that of large companies, e.g., the police have a centralised supply and Bertelsmann still wants to establish one.

14.8. Reflective diary

Upon completion I wrote this diary that reflects the different steps and stages of my DBA study. I can describe the last few years as a rocky and difficult journey with many up and downs and never an end in sight. I gathered a lot of knowledge and experience in academic research during my time studying. The first workshop in January 2009 was an interesting experience because I had not before heard about philosophical underpinning of research. Through my study degrees in engineering, computer science and economics I learned that results are only reliable if they are proven by deductive logic. I never thought about it, but I used the positivistic paradigm. In this workshop I learned that in the research there are more ways of seeing and understanding reality.

During the second workshop in March 2009 I revisited and increased the depth of my knowledge about quantitative research methods. In this research module and with the preparation of the assignment, I learned to prove my research results accurately. I also improved my skills in developing a questionnaire and performing a survey. I understood that problems in the data collection phase have to be identified in the design phase of the research.
The third workshop in July 2009 was about qualitative research. In my previous studies, I had never thought about case studies and case study research although these are quite common in academic research. This workshop together with the preparation of the assignment, I provided experience and a more in-depth view of how to use the different research methods such as participant observation and interviews and gain reliable results from them.

I particularly built my skills and experience in Yin’s case study methods and data analysis during this workshop, which were very important for my later research. The workshop in August 2009 was about critical reading and evaluation. Here I learned how to prove the quality and reliability of information and sources. This was my favourite workshop which was also very helpful for my later research in order to evaluate information. The rating system to classify the value of academic publications and articles was quite new to me. I gained experience by searching in different research and literature data-bases and learned the strengths and weaknesses of different research strategies. With the experience of this workshop it was easier to find and select the right articles in the various literature databases.

On the whole, I could say that I built up enough abilities to compare the different articles and evaluate their transferability and their limitations of the results for my research. November 2009 was the last workshop that dealt with proposal writing. I found out that it is not easy to write an adequate research proposal. My first proposal was detailed and had a methodology with quantitative and qualitative research elements. My supervisor helped me write a shorter one with a clear structure and qualitative research elements because since I had not initially realised that this is quite too much even for a doctoral thesis. I therefore shortened my research proposal and used case studies with interviews in public administration and private companies. Due to my more than ten years of experience as an IT manager in the police force I had a good understanding of IT centralisation and IT outsourcing within this organisation. Through discussion and with the assistance of my supervisor I developed the research question: how is the IT governance of IT sourcing of the NRW Police comparable with private companies? After the document analysis and the first interviews...
I found out that the terminology IT outsourcing is outdated and that in literature the new term IT sourcing is generally used. I therefore changed this word in my research questions. During this phase I understood that research should be a flexible revolving cycle: this means that the methodology has to be adapted to every new situation during the research process.

The process to find companies for my interviews was quite frustrating because many companies did not have any interest to provide internal company data for a research project. I contacted more than fifty companies and found four that fitted my research scheme and were willing to assist me. Only large companies have an IT environment comparable to the police and it was not easy to convince the IT manager in the police force and private companies to participate in my research. I did not use the names of the interviewees in the three police authorities in order to avoid any trouble for them with the Ministry of the Interior.

I obtained very detailed information from them which was not influenced by the view of the current governing political party. E.g., the Police Marshal Mr R. from the Ministry of the Interior had not made any statements about outsourcing success in the official interview. I also tried to use ITIL for my research but I realised that ITIL only answers how something is done in the area of IT. Therefore, I used COBIT which deals with what is done in IT. At this stage my supervisor advised me to use the same methodology as the DBA student Mitteregger who had a similar research theme.

My issue with this research is that the sample of eight interviews is too small to draw general conclusions. They all generally deal with IT in the same manner but I realised that the maturity of the IT governance processes was not equally developed in private companies. The idea to compare the companies in cross-case analysis was the best way to obtain reliable results. I could then evaluate the IT governance and the maturity of the IT processes in the police force with the final comparison of the results. In conclusion, I could say that the DBA study influenced my daily work as an IT manager. I work on new projects and tasks more professional and evaluate IT situations more critically. Furthermore, I now use COBIT and ITIL guidelines for my work.
15. Glossary

**Case study**  
“The essence of a case study, the central tendency among all types of case study is that it tries to illuminate a decision or a set of decisions: why they were taken, how they were implemented, and with what result.” (Schramm, 1971, cited by Yin, 2009, page 17)  
In literature the term case study is sometimes defined only as a data collection method and not as an independent method. In 2009 Yin said that this definition is not enough.

**COBIT**  
COBIT is a business framework for the management and IT governance of an enterprise. It was developed by the ISACA, a non-profit and independent association.  
(ITGI, 2014)

**Construct validity**  
identifying correct operational measures for the concept being studied (Yin, 2009, page 40)

**Corporate governance**  
Corporate governance can be defined as the efficient management and control of shareholder organisations by their managers with the aim of shareholder value maximisation. (Reckemmer, 2004). In contrast to this is the OECD’s (Organisation for Economic Cooperation and Development) definition from 1999. "The system by which business corporations are directed and controlled."

**EBITDA**  
Earnings before interests, taxes, depreciation and amortisation

**Deduction**  
Deduction is a procedure to draw logical conclusions from a general issue to a special one. This means that we can achieve special findings from a general theory. (Remenyi et al., 1998)

**External Validity**  
defining the domain to which a study's findings can be generalised (Yin, 2009, page 40)

**Induction**  
Induction is a generalised conclusion from a broad range of different observations or issues. In the past scientists used this research method to conclude for example from several natural phenomenons in the laws of nature (Remenyi, 1998).
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Internal validity

Seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships (Yin, 2009, page 40)

ITIL

The Information Technology Infrastructure Library (ITIL) is a collection of proven recommendations (best practices) for the optimal development of important processes of an IT service provider. ITIL describes a professional, systematic action for the management of IT services in which the economic fulfilment of the customer standards is a priority. In this area, ITIL became the only comprehensive procedure library and established itself as the worldwide used standard. (ITGI, 2013)

IP

Internet protocol (communication technology)

IPTV

Internet protocol television (communication technology)

ISACA

ISACA was established in 1969 and is a global non-profit association of 140,000 professionals in 180 countries. ISACA offers the IT governance framework COBIT (ITGI, 2012).

IT

Information technology

ITGI

“The IT Governance Institute (ITGI) was formed by ISACA in 1998 to advance international thinking on GEIT” (ITGI, 2012).

IT.NRW

Internal IT service provider of the state NRW

KGaG

Unlisted limited joint-stock partnership (type of enterprise in Germany)

KPB and PP

The main focus of the police work in North Rhine-Westphalia lay with 47 police authorities. Their purviews coincide mostly with those of the (major) on independent towns and districts. The police authorities consist of 18 police presidiums (PP) in the independent towns and the 29 polices authorities (KPB) in districts. Here beside the administrative duties to be perceived in all KPB the execution duties are divided into the core areas danger defence/ application, criminal activity and traffic accident control. (Polizei NRW, 2009)
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LAFP
The duties of the LAFP are described in particular in §13b of the police organisation law (POG). With approx. 1,200 employees it is responsible for the education and advanced training of the police, apart from the education are not perceived by the four universities for public management and that of the district police authorities as education authorities. Besides the LAFP takes charge of district police authorities in all official-juridical and personnel matters. (www.polizei-nrw.de, 2009)

LKA
The duties of the LKA arise in particular from §13 POG. It has his seat in Dusseldorf and is a central office for criminal-police duties with nearly 1,000 employees. It supports the Ministry of the Interior in matters of criminal activity fight and the KPB with the preventive fight as well as with the pursuit and clarification of criminal offences. (www.polizei.nrw.de, 2009)

LZPD
The duties of the LZPD are summarised in §13a POG. The central location is in Duisburg, the biggest branch office is accommodated in Neuss. In these regional authorities in whom more than 1,000 employees work a huge number of different duties is bundled up. Thus the LZPD supports the Ministry of the Interior in all questions of the danger defence and it nationally co-ordinates forces. Beside these surgically straightened duties it is responsible for the technical equipment of the police and all matters of information technology and communication technology. According to regulations of the Ministry of the Interior its duties include the control and guidance as well as interests of budgetary problems, economic problems and immovable problems are perceived here state-wide for the police of North Rhine-Westphalia. (www.polizei.nrw.de, 2009)

Mittelstand
German mid-sized companies

MIK
Ministry of the Interior of the state North Rhine-Westphalia

OECD
Organisation for Economic Cooperation and Development

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Public value  
In 1995, Moore published his new ideas in contribution to public management theories and practice in his book “creating public value”. At this time it was clear, that these ideas had not been adapted from current management theories and academic research. Moore developed this from his long-term experience in teaching and his commitment in the public service. (Moore, 1995; Moore et al., 2011)

Reliability  
demonstrating that operations of a study – such as the data collection procedures – can be repeated, with the same results (Yin, 2009, page 40)

Triangulation  
Triangulation is a researcher strategy for which data or methods from different sources are used. The aim of this research method is to achieve more valid results whilst reducing the possibility of systematic errors. According to Norman Denzi’s theory from 1970 there are four types of triangulation research methods the data-, the scientist-, the theory- and the method triangulation. Many scientists are the opinion that the triangulation research method leads only to more data and not to more valid results. (Sekaran, 2003; Yin, 2009)

VOIP  
voice over internet protocol (communication technology)
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16. Bibliography

16.1. Books and journals


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16.2. Websites


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17. Appendix

Fragebogen/ Interview Leitfaden (interview questionnaire German version)
In der Abschlussarbeit meines Promotionsstudiums befasse ich mich mit der Frage, ob die IT Steuerungsmodelle und IT Strategien privater großer Firmen und der Polizei NRW vergleichbar sind und in welchen Punkten sie sich unterscheiden. In den letzten Jahren hat sich die IT der Polizei NRW grundlegend verändert. Die Modernisierung und Zentralisierung der IT bei dem LZPD und IT.NRW führte zu einer herausragenden IT Infrastruktur, die vergleichbar ist mit der IT in modernen Großunternehmen. Ich benutze für die Datenanalyse das Domänen Modell COBIT, das weltweit akzeptiert in diesem Bereich ist. Es dient dazu, den Reifegrad der IT Strategie und der Steuerung zu messen.

Demographische Fragen
1. In welchem Bereich und in welcher Position arbeiten Sie?
2. Wie sind der Firmenname und die Gesellschaftsform des Unternehmens?
3. Welche Marktposition hat die Firma und zu welcher Branche gehört sie?
4. Wie viele Mitarbeiter hat die Firma in Deutschland und weltweit?
5. Wie ist die IT Struktur des Unternehmens (Netzwerktechnik bzw. Netzarchitektur, Anzahl der Server, Arbeitsplätze und Rechenzentren)
6. Wie viele IT Abteilungen und IT Spezialisten hat das Unternehmen?
7. Welche Systeme und Software werden eingesetzt?
8. Welche Teile der IT wurden extern ausgelagert und wann geschah das?
9. Gab es irgendwelche Probleme damit und wenn ja welche?
10. Sind irgendwelche Outsourcing Projekte in der Planung und Realisierung?
11. Was sind die Ziele und Vorteile für ihre Outsourcing Strategie?
12. Was sind die Schlüsselfaktoren ihres erfolgreichen Outsourcings?

Strategische Ausrichtung (Strategic Alignment)
1. Hat das Management die IT Strategie klar definiert und kommuniziert?
2. Gibt es irgendwelche Richtlinien und Prozesse, die die Koordination der IT-Strategie mit der Unternehmensstrategie definieren?
3. Wie ist die IT-Strategie für ein Jahr und für fünf Jahre?
4. Wie ist die IT-Sourcing Strategie für die nächsten Jahre?
5. Hat die Firma eine klare Position bezüglich neuer Technologie in der IT (Pionier, Früher Realisierer, Mitläufer oder später Mitläufer)?
6. Kann die IT-Architektur das Kerngeschäft maximal unterstützen?
7. Wer ist im Unternehmen verantwortlich für IT-Strategie Entscheidungen?
8. Wie wichtig ist die IT für den Unternehmenserfolg?
9. Hat das Unternehmen einen Chief Information Officer CIO im Management?
10. Wie wichtig sehen andere Unternehmensteile die IT?

Wertschöpfung der IT (Value delivery)
1. Wer entscheidet über die internen und externen Einsatz von IT-Resourcen?
2. Werden die Ziele der wirtschaftlichen, strategischen und technischen Vorteile von Outsourcing erfüllt?
3. Wie zufrieden ist das Management mit den ausgelagerten IT Bereichen?
4. Wie zufrieden ist das Management mit der IT-Struktur und der Dienstleistungen?
5. Wie ist die Performance und wie robust, sicher und benutzerfreundlich sind die IT Systeme?
6. Wie schnell, integer und genau sind die bereitgestellten Daten?
7. Wie oft scheitern IT Projekte und werden IT Ziele nicht erreicht?
8. Sind Service Level für interne und externe IT Dienstleistungen klar definiert?

9. Sind die Verantwortlichkeiten für IT Prozesse, IT Applikationen und IT Infrastruktur klar definiert?
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10. Wie vertraut ist die IT mit den Geschäftsanforderungen?

Ressourcen Management (Resource management)
1. Wie oft und wie viele externe IT Fachkräfte wurden angefordert?
2. Wie wird das Fachwissen der IT Fachkräfte entwickelt?
3. Wie gut sind die betriebswirtschaftlichen Kenntnisse der IT Fachkräfte?
4. Wie gut ist das Fachwissen der IT Fachkräfte?
5. Ist die IT Infrastruktur und Kapazität groß genug für die aktuellen und zukünftigen Geschäftsanforderungen?
6. Wie oft wird das IT Budget überzogen, um die Geschäftsanforderungen zu erfüllen?
7. Wie oft wird das IT Projekt Budget überzogen?
8. Gibt es ein Prozessdiagramm für das Management von IT Ressourcen?
9. Wie funktioniert der Einkauf von IT Ressourcen?
10. Wie werden Lieferanten ausgewählt und überprüft?

Risiko Management (Risk management)
1. Hat das Unternehmen ein Risiko Rahmenwerk oder ein Prozessablauf und wie funktioniert dieser?
2. Wie funktioniert das Risiko Abschätzung im Unternehmen?
3. Gibt es irgendwelche Worst-Case Szenarien und Notfallpläne und wie werden diese trainiert?
4. Werden die internen und externen IT Fachkräfte regelmäßig in der IT Sicherheit und IT Risikomanagement geschult?
5. Wie werden die IT Risiken vom Management in den Geschäftsplänen berücksichtigt?
6. Wie werden Geschäftsziele und Strategien im IT Risikomanagement berücksichtigt?
7. Ist das Management ständig über IT Kosten, Änderungen, Projekte und Risiken informiert?
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8. Hat das Unternehmen einen IT Sicherheitsbeauftragten (Chief Information Security Officer (CISO))? 
9. Sind die internen und externen IT Prozesse klar definiert und dokumentiert? 
10. Wie ist die Beziehung des Unternehmens zu IT Dienstleistern und Lieferanten?

Performance Messung (Performance measurement)
1. Wie wird im Unternehmen die IT Effizienz und Wirtschaftlichkeit und die Erfüllung der Unternehmensziele gemessen? 
2. Gibt es einen Prozessablauf für permanente IT Optimierungen?
3. Wie schnell können Änderungen in der IT Infrastruktur realisiert werden?
4. Welche Methoden werden verwendet, um die Benutzerzufriedenheit und die Qualität der IT Dienstleistungen zu messen?
5. Welche Service Level hat das Unternehmen für interne IT Dienstleistungen?
6. Welche Service Level hat das Unternehmen für externe IT Dienstleistungen?
7. Wie funktioniert die Qualitätskontrolle von IT Dienstleistern und Lieferanten?
8. Gibt es ein Benchmarking für die verschiedenen IT Dienstleistern und Lieferanten?
9. Ist das Management ständig über das interne IT Kontrollsystem informiert?
10. Ist das Management ständig über den Status der IT informiert?

IT Outsourcing Fragen
1. Outsourcing hilft dem Unternehmen Kosten der IT zu reduzieren.
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

2. Outsourcing verbessert die Kontrolle über die IT Kosten im Unternehmen.
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

3. Outsourcing verbessert die Flexibilität der IT Kosten im Unternehmen.
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%
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4. Das Unternehmen hat Zugang zu innovativen Know-How durch externe Fachkräfte?
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

5. Durch Outsourcing hält das Unternehmen die Infrastruktur und die IT auf dem aktuellen Stand?
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

6. Das Unternehmen erhöht die Effizienz und Qualität in den ausgelagerten Bereichen?
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

7. Das Unternehmen erhöht die IT Sicherheit in den ausgelagerten Bereichen?
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

8. Das Unternehmen vermindert die IT Risiken in den ausgelagerten Bereichen?
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

9. IT Dienstleister helfen dem Unternehmen Innovationen und Änderungen schneller umzusetzen.
   O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

10. Mit Outsourcing kann sich das Unternehmen jetzt auf seine Kernbereiche konzentrieren.
    O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

11. Durch Outsourcing reduziert das Unternehmen die Abhängigkeit von internen IT Fachkräften.
    O stimmt gar nicht  O stimmt nicht  O neutral  O stimmt  O stimmt 100%

12. Durch Outsourcing reduziert das Unternehmen die Abhängigkeit von der internen Weiterbildung und Rekrutierung.

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**Key Figures (IFRS)**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Development</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consolidated revenues</td>
<td>16,356</td>
<td>16,065</td>
<td>15,253</td>
<td>15,786</td>
<td>15,364</td>
</tr>
<tr>
<td>Operating EBIT</td>
<td>1,754</td>
<td>1,732</td>
<td>1,746</td>
<td>1,852</td>
<td>1,424</td>
</tr>
<tr>
<td>Operating EBITDA</td>
<td>2,313</td>
<td>2,210</td>
<td>2,234</td>
<td>2,400</td>
<td>2,003</td>
</tr>
<tr>
<td>Return on sales in percent(^1)</td>
<td>10.7</td>
<td>10.8</td>
<td>11.4</td>
<td>11.7</td>
<td>9.3</td>
</tr>
<tr>
<td>Bertelsmann Value Added (BVA)(^2)</td>
<td>283</td>
<td>362</td>
<td>356</td>
<td>371</td>
<td>26</td>
</tr>
<tr>
<td>Group profit</td>
<td>870</td>
<td>612</td>
<td>612</td>
<td>656</td>
<td>35</td>
</tr>
<tr>
<td>Investments</td>
<td>1,312</td>
<td>655</td>
<td>956</td>
<td>753</td>
<td>662</td>
</tr>
</tbody>
</table>

| **Consolidated Balance Sheet** |       |       |       |       |       |
|                              |       |       |       |       |       |
| Equity                      | 8,738 | 6,083 | 6,149 | 6,486 | 5,980 |
| Equity ratio in percent     | 40.7  | 32.2  | 33.9  | 34.5  | 30.9  |
| Total assets                | 21,448| 18,864| 18,148| 18,779| 19,378|
| Net financial debt          | 636   | 1,218 | 1,809 | 1,913 | 2,793 |
| Economic debt\(^3\)         | 4,178 | 4,773 | 4,913 | 4,915 | 6,024 |
| Leverage Factor             | 2.0   | 2.3   | 2.4   | 2.3   | 3.2   |

| **Employees** (in absolute numbers) |       |       |       |       |       |
| Germany                      | 38,840| 38,434| 37,519| 36,462| 36,930|
| Other countries              | 72,923| 65,852| 65,107| 67,957| 66,053|
| Total                        | 111,763| 104,286| 100,626| 104,419| 102,983|

| Dividends to Bertelsmann’s shareholders | 180 | 180 | 180 | 180 | 60 |
| Distribution on Profit Participation Certificates | 44 | 44 | 44 | 44 | 75 |
| Employee profit sharing       | 101  | 92   | 107  | 118  | 65  |

Figures adjusted for the financial year 2012; figures before 2012 as reported in the respective financial year.

1) Based on operating EBIT.

2) Bertelsmann uses the BVA as a strictly defined key performance indicator to evaluate the profitability of the operating business and the return on investment.

3) Taking into account the financial debt assumed, investments amounted to €1,988 million (2012: €655 million).

4) Net financial debt plus pension provisions, profit participation capital and net present value of operating leases.

Table 29: Key Financials of the Bertelsmann Group (Bertelsmann annual report, 2013)
Are the IT outsourcing strategies and IT governance of large companies practical for the NRW police and in which issues do they differ?

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<table>
<thead>
<tr>
<th>Net profit (loss)</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net profit (loss) (adjusted for special factors)</td>
<td>-12,1</td>
<td>2,4</td>
<td>2,8</td>
<td>2,5</td>
<td>2,9</td>
</tr>
<tr>
<td>EBITDA&lt;sup&gt;a, c&lt;/sup&gt;</td>
<td>12,5</td>
<td>17,8</td>
<td>15,8</td>
<td>18,0</td>
<td>20,0</td>
</tr>
<tr>
<td>EBITDA (adjusted for special factors)&lt;sup&gt;b, c&lt;/sup&gt;</td>
<td>0,8</td>
<td>17,6</td>
<td>17,4</td>
<td>18,0</td>
<td>18,7</td>
</tr>
<tr>
<td>EBITDA margin (adjusted % for special factors)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0,9</td>
<td>28,0</td>
<td>28,9</td>
<td>30,9</td>
<td>31,8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Profitability</th>
<th>Change compared to prior year %&lt;sup&gt;a&lt;/sup&gt;</th>
<th>2014</th>
<th>2013</th>
<th>2012</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROCE</td>
<td>%</td>
<td>1,7</td>
<td>5,5</td>
<td>3,8</td>
<td>-2,4</td>
<td>3,8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statement of financial position</th>
<th>Change compared to prior year %&lt;sup&gt;a&lt;/sup&gt;</th>
<th>2014</th>
<th>2013</th>
<th>2012</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>9,5</td>
<td>129,4</td>
<td>118,1</td>
<td>107,9</td>
<td>122,5</td>
<td>127,8</td>
</tr>
<tr>
<td>Shareholders’ equity</td>
<td>6,2</td>
<td>34,1</td>
<td>32,1</td>
<td>30,5</td>
<td>40,0</td>
<td>43,0</td>
</tr>
<tr>
<td>Equity ratio&lt;sup&gt;a&lt;/sup&gt;</td>
<td>%-0,8</td>
<td>26,3</td>
<td>27,1</td>
<td>28,3</td>
<td>32,7</td>
<td>33,7</td>
</tr>
<tr>
<td>Net debt&lt;sup&gt;c&lt;/sup&gt;</td>
<td>8,7</td>
<td>42,5</td>
<td>39,1</td>
<td>36,9</td>
<td>40,1</td>
<td>42,3</td>
</tr>
<tr>
<td>Relative debt (Net debt/EBITDA (adjusted for special factors))&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>n. a.</td>
<td>2,4</td>
<td>2,2</td>
<td>2,1</td>
<td>2,1</td>
<td>2,2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cash flows</th>
<th>Change compared to prior year %&lt;sup&gt;a&lt;/sup&gt;</th>
<th>2014</th>
<th>2013</th>
<th>2012</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cash from operating activities</td>
<td>2,9</td>
<td>13,4</td>
<td>13,0</td>
<td>13,6</td>
<td>16,2</td>
<td>14,7</td>
</tr>
<tr>
<td>Cash capex</td>
<td>-7,0</td>
<td>-11,8</td>
<td>-8,4</td>
<td>-8,4</td>
<td>-9,9</td>
<td>-9,9</td>
</tr>
<tr>
<td>Free cash flow (before dividend payments, spectrum investment)&lt;sup&gt;d, e, f, g&lt;/sup&gt;</td>
<td>-10,1</td>
<td>4,1</td>
<td>4,6</td>
<td>6,2</td>
<td>6,4</td>
<td>6,5</td>
</tr>
<tr>
<td>Net cash used in investing activities</td>
<td>-8,7</td>
<td>-10,8</td>
<td>9,9</td>
<td>-6,7</td>
<td>-9,3</td>
<td>-10,7</td>
</tr>
<tr>
<td>Net cash (used in) from financing activities</td>
<td>n. a.</td>
<td>-3,4</td>
<td>1,0</td>
<td>-6,6</td>
<td>-6,0</td>
<td>-6,4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employees</th>
<th>Change compared to prior year %&lt;sup&gt;a&lt;/sup&gt;</th>
<th>2014</th>
<th>2013</th>
<th>2012</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of employees (full-time equivalents, without trainees)</td>
<td>-0,6</td>
<td>228</td>
<td>230</td>
<td>232</td>
<td>240</td>
<td>252</td>
</tr>
<tr>
<td>Revenue per employee&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4,9</td>
<td>274,5261,8250,4244,0247,2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T-Share – key figures | Change compared to prior year %<sup>a</sup> | 2014 | 2013 | 2012 | 2011 | 2010 |
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<table>
<thead>
<tr>
<th></th>
<th>pared to prior year %&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings per share (basic and diluted)</td>
<td>€ n. a. 0.65 0.21 -1.24 0.13 0.39</td>
</tr>
<tr>
<td>Dividend per share&lt;sup&gt;b&lt;/sup&gt;</td>
<td>€ n. a. 0.50 0.50 0.70 0.70 0.70</td>
</tr>
<tr>
<td>Total dividend&lt;sup&gt;c&lt;/sup&gt;</td>
<td>billions of € n. a. 2.3 2.2 3.0 3.0 3.0</td>
</tr>
<tr>
<td>Total number of ordinary shares at the reporting date&lt;sup&gt;d&lt;/sup&gt;</td>
<td>millions 1.9 4.5364.4514.3214.3214.321</td>
</tr>
</tbody>
</table>

<sup>a</sup> Calculated on the basis of millions for the purpose of greater precision. Changes to percentages expressed as percentage points.

<sup>b</sup> Deutsche Telekom defines EBITDA as profit/loss from operations before depreciation, amortization and impairment losses.

<sup>c</sup> EBITDA, EBITDA adjusted for special factors, net debt, and free cash flow are non-GAAP figures not governed by the International Financial Reporting Standards (IFRS). They should not be viewed in isolation as an alternative to profit or loss from operations, net profit or loss, net cash from operating activities, the liabilities reported in the consolidated statement of financial position, or other Deutsche Telekom key performance indicators presented in accordance with IFRS. For detailed information and calculations, please refer to the section “Development of business in the Group” in the combined management report in this Annual Report, Page 82 et seq.

<sup>d</sup> Figures for 2006 include EUR 3.3 billion for the acquisition of licenses.

<sup>e</sup> Since the beginning of the 2007 financial year, Deutsche Telekom has defined free cash flow as cash generated from operations less interest paid and net cash outflows for investments in intangible assets (excluding goodwill) and property, plant and equipment. Prior-year figures have been adjusted accordingly.

<sup>f</sup> And before PTC and AT&T transactions and compensation payments for Metro PCS employees.

<sup>g</sup> Subject to approval by the relevant bodies and the fulfilment of other statutory requirements.

<sup>h</sup> Subject to approval by the 2015 shareholders’ meeting concerning the dividend payments for the 2014 financial year. For more detailed explanations, please refer to Note 28 “Dividend per share,” Page 236.

<sup>i</sup> Including treasury shares held by Deutsche Telekom AG. Key data of the Group.

Table 30: Key figures of the Deutsche Telekom (Telekom, 2014)