OPENING THE BLACK BOXES OF TAM: TOWARDS A MIXED METHODS APPROACH

Research-in-Progress

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Abstract

The aim of this paper is to discuss the significance and potentials of a mixed methods approach in technology acceptance research. After criticizing the dominance of the quantitative survey method in TAM-based research, this paper reports a mixed methods study of user acceptance of emergency alert technology in order to illustrate the benefits of combining qualitative and quantitative techniques in a single study. The main conclusion is that a mixed methods approach provides opportunities to move beyond the vague conceptualizations of “usefulness” and “ease of use” and to advance our understanding of user acceptance of technology.

Keywords: Mixed methods, technology acceptance, TAM, emergency alert technology
Introduction

Since its proposition in 1989 by Fred Davis, the technology acceptance model (TAM) has been a popular model for studying user acceptance of information technology. Based on the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980), TAM posits that an individual’s intention of using a technology is jointly determined by his or her perception of the technology’s usefulness (Perceived Usefulness, PU) and of its ease of use (Perceived Ease of Use, PEoU). Over the course of two decades, numerous studies have been conducted in order to validate, extend and apply TAM in various research settings. At the time of this writing, Davis’ 1989 article has been the subject of 4,899 citations, according to Google Scholar.

The popularity of TAM may result from its theoretical simplicity and the robustness of its standardized measurement. Prior TAM studies confirm that the model consistently explains more than 50% of variance in acceptance (Dillon, 2001; Venkatesh et al., 2003; King and He, 2006). Moreover, Information Systems (IS) scholars appreciate such a parsimonious model because it provides not only an initial road map for planning empirical studies, but also a common discourse with which scholarly dialogues and meaningful comparisons across different studies may be carried out.

However, parsimony is also an “Achilles’ heel” of TAM, insofar as generic constructs such as PU and PEoU in TAM have “seduced researchers into overlooking the fallacy of simplicity” (Bagozzi, 2007, p. 244) and steered us away from scrutinizing specific determinants in different usage contexts. As Benbasat and Barki (2007) stated, “study after study has reiterated the importance of PU, with very little research effort going into investigating what actually makes a system useful. In other words, PU and PEoU have largely been treated as black boxes that very few have tried to pry open” (p. 212).

Through a critical review of literature and by reference to a recently completed acceptance study, this paper aims to showcase the importance of methodological pluralism in “opening the black boxes” of TAM. More specifically, through criticizing the IS field’s overuse of quantitative survey method, it advocates a mixed method approach to deepening our understanding of user acceptance of technology.

A Survey-Dominated Tradition of TAM Research

Given the fact that TAM originated from quantitative survey research, it is not surprising that quantitative methodology – in particular, the questionnaire-based survey method – dominates the field. For example, in the 101 TAM articles reviewed by Lee et al. (2003), all but three studies used quantitative survey data only. Another meta-analysis article by King and He (2006) went so far as to completely ignore the methodology issue because of the lack of variety in methods used in TAM studies.

While survey-based studies of technology acceptance have been a fruitful stream of research, the over-reliance on survey method creates some potential problems. First, all the data gathered from questionnaires are self-reported, and therefore prone to the biases associated with several methodological and contextual factors. For example, in such studies the independent variables (perceptions) are not “independent” of attitudes or intentions because the perceptions are often based on the actual or on similar usage experiences (Straub and Burton-Jones, 2007). Survey-based studies in general are often subject to such issues as acquiescence, social desirability and non-response bias (Converse and Presser, 1986). As a result, some TAM studies have found that self-reported use intention might not lead to the actual use behavior (Manfredo and Shelby, 1988; Sharma et al., 2004).

Second, quantitative data analysis often follows the principle of data reduction, using statistical strategies (e.g., factor analysis and structural equation modeling), which reduces interactions which in reality are complex and interdependent to linear, deterministic and quantifiable relations. From this perspective, it is not surprising that two decades of TAM research have yielded very limited new discoveries about the model itself, as closed survey instruments are inflexible to discoveries and ad-hoc changes during the research process. Kraemer and Dutton’s (1991) criticism of survey research, that it is a-theoretical and ill-suited to addressing the subtleties of IT in complex settings, may seem harsh, but is still relevant to a great extent. This criticism echoes Glaser and Strauss’ (1967) advocacy of theory building through an inductive approach and Meehl’s (1978) warning that social sciences cannot advance through the continual utility of statistical significance tests. These influential researchers hold the belief that social science research involves so many uncontrollable variables that the “scientific” methods adopted in natural sciences may not be able to capture the complexity and essence of human behavior in social systems.
These criticisms often lead to the longstanding debate about positivism versus interpretivism in the broader context of social science research. In IS literature, the dichotomy between these two epistemological paradigms has also been extensively discussed (see, for example, Lee, 1991; Mingers, 2001; Trauth and Jessup, 2000), with the general consensus being that positivism dominates the IS field. Orlikowski and Baroudi (1991) examined 155 articles published between 1985 and 1989 in major IS journals and found that the positivist paradigm overwhelmingly dominated the IS research community (96.8%), whereas little attention was paid to the interpretive approach (3.2%). A follow-up study by Chen and Hirschham (2004) examined IS publications from 1991 to 2001 and found that the imbalance in research paradigms still exists, despite years of advocacy of paradigmatic pluralism (81% of empirical studies are positivist in nature). The dominance of the quantitative survey method in TAM research, therefore, accords with this positivist tradition. For instance, Palvia et al. (2003) examined 13 methodologies, as used by seven MIS journals during a five-year period (1993-1997), and concluded that the survey method consistently ranked highest, despite the increasing use of other methods.

The reasons behind the strength of positivism in IS are multi-fold and too complicated to be covered in this paper. What needs to be noted here, however, is that IS, as a relatively new field, tends to focus on maximizing the external validity of a particular theory rather than on refining the theory in depth in various contexts (Palvia et al., 2003; Scandura and Williams, 2000). TAM is an example of this, in that it represents the field’s eagerness to establish its identity through one “universal theory”. As a result, when it comes to refining TAM, the general approach is to “patch up” the model rather than to reexamine its original constructs. Two common strategies of “patching up” include: 1) introducing additional constructs to the model so that more statistical prediction power can be gained, and 2) including antecedents or contextual factors while adhering to the two central constructs (PU and PEoU). The need for patching usually results from changing technology and from the technological context. For example, when studying computer use in the workplace, Davis, Bagozzi and Warshaw (1992) introduced the “perceived enjoyment” construct to TAM. The so-called TAM2 introduced the subjective norm (SN) as an additional predictor of intention in mandatory settings (Venkatesh and Davis, 2000). Venkatesh and Davis (1996) found that PEoU is influenced by an individual user’s computer self-efficacy and by the system’s usability, and that the latter is further influenced by the user’s prior experience with the system. Chang et al. (2005) postulated that PU is influenced by “quality antecedents”, such as information quality and credibility in physicians’ acceptance of telemedicine technology. Among all these “patching” efforts, the most notable is perhaps that of Venkatsh et al (2003) in their UTAUT model, which includes 41 independent variables for predicting intentions and at least eight independent variables for predicting behavior.

Nevertheless, apart from the original theorization by Davis and our common-sense understanding, the meanings of PU and PEoU have not been elucidated by most of these studies. Located within the positivist paradigm, TAM studies generally assume that system features and user characteristics are static and independent of contexts, which leads to the conceptualizations of PU and PEoU as fixed, transferrable and quantifiable in closed surveys. Many studies have adhered to the following path of empirical investigation: review previous literature → select relevant factors such as PU and PEoU for the study → propose hypotheses/model → collect empirical data from a quantitative survey → test the hypotheses and/or validate the model. Despite the abundance of TAM studies, there are few which have included the conducting of qualitative investigations into the local meanings of PU and PEoU prior to using the constructs in hypothesis formulation and testing. Simply put, many researchers rush to the field in order to ask close-end questions without thinking about what are the right questions to ask. Constructing survey questions, a vital element in ensuring the validity of empirical research, has largely been overshadowed by trendy statistical analyses of quantitative data.

**A Mixed Methods Approach**

In light of the above mentioned issues resulting from the over-reliance on quantitative survey methodology in TAM studies, we argue that a mixed methods approach combining both qualitative and quantitative techniques deserves more attention from IS scholars. Mixed methods is not a new concept in the IS field, but its advantages have not been fully appreciated in the technology acceptance domain. Mixed methods offer not only “new tricks” for collecting and analyzing data; more importantly, they have the potential to foster theory building.

It is worth noting that mixed methods research means not simply conducting two separate strands of quantitative and qualitative studies. These studies and their findings must in some way follow a logic of integration (Creswell and Tashakkori, 2007). There exist different ways of mixing quantitative and qualitative methods within or across different stages of research (Tashakkori and Teddlie, 2003; Creswell, 2003). Two common dimensions of viewing
mixed methods are 1) the time ordering (concurrent or sequential) of the qualitative and quantitative phases, and 2) the degree of dominance of either quantitative or qualitative methods. Johnson and Onwuegbuzie (2004) provided a matrix to illustrate the nine possible combinations of the mixture:

In the matrix figure above, “quan” stands for quantitative and “qual” for qualitative. Capital letters denote high priority or weight. The sign “+” stands for concurrent, and “⇒” stands for sequential. In the same vein, Creswell (2003) described six mixed methods designs: 1) sequential explanatory design (“QUAN ⇒ qual”); 2) sequential exploratory design (“QUAL ⇒ quan”); 3) sequential transformative design (move between qualitative and quantitative without clear priority); 4) concurrent triangulation strategy (“QUAN + QUAL”); 5) concurrent nested strategy (qualitative embedded in quantitative, or vice versa); and 6) concurrent transformative strategy (qualitative and quantitative methods used concurrently without clear priority). Certainly, a researcher should choose one combination that best suits his or her research needs in a study. No matter what design a researcher adopts, the purpose of the mixture is either to examine the same phenomenon through a different lens with each method, bringing out distinctive insights, or to use one method to develop and validate the constructs used in another method, or both of these. The case study described in the following section serves as an example of mixed methods research on technology acceptance.

**A Mixed Methods Case Study**

This section briefly describes a recently completed case study of user acceptance of emergency alert technology. The purpose of the project was to investigate factors that influenced the acceptance of Campus Alerts – an SMS (short message service)-based emergency notification system currently employed at Eastcoast University. The study illustrates how different methods may be integrated into one study in order to facilitate a TAM-based understanding of “usefulness” and “ease of use”. Following a sequential design, the study consisted of three phases and a total of four different data collection methods were used. The three phases roughly mirror the “three levels of understanding” proposed by Lee (1991). In an attempt to integrate positivism and interpretivism in organizational research, Lee proposed a framework in which different research paradigms coexist in order to facilitate understanding on different levels. According to him, the first level of understanding is “subjective understanding”, which consists of the common-sense and everyday meaning of reality; the second level of understanding is the “interpretive understanding”, which consists of the researcher's systematic interpretation of the first-level meaning;

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1 In the IS literature, it is not uncommon for “case study” to be viewed as a synonym of “qualitative research”, or at least as a typical qualitative method (e.g., Gable, 1994). However, the case study is a research strategy whose method can be either qualitative or quantitative in nature, or a mixture of both. For detailed discussions of methodological paradigms and the case study approach, see (Lee, 1989; Myers, 2009; Yin, 2003).

2 Both “Campus Alerts” and “Eastcoast University” are pseudonyms.
and the third level is the “positivist understanding” that tests the researcher's propositions in a "formal" and "scientific" manner. Table 1 below shows a mapping between the phases, the levels of understanding, and the research methods:

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<th>Table 1. Project Phases, Levels of Understanding and Research Methods</th>
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<tr>
<td><strong>Project Phase</strong></td>
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<tr>
<td>Phase 1: Observing the deployment and the acceptance of Campus Alerts</td>
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| Phase 2: Interviewing students at Eastcoast University regarding their perceptions and experiences with Campus Alerts | 2\(^{nd}\) level: Interpretive understanding | - Individual interview  
| | | - Focus group |
| Phase 3: Collecting quantitative data regarding the acceptance from a larger sample of Eastcoast University students | 3\(^{rd}\) level: Positivist understanding | Questionnaire survey |

**Phase 1: Subjective Understanding from Observation**

On April 16, 2007, a gunman massacred 32 people on the campus of Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg, Virginia, United States. After the university was criticized for a slow response to the shooting, immediate alerts became a priority for many American universities. It was widely believed that SMS on mobile devices would allow authorities to communicate with students in a more timely fashion when such emergencies occur (e.g., Yuan et al., 2007). In this context, Eastcoast University introduced Campus Alerts to its students in late April 2007. Since the University is located in a metropolitan area where the crime rate is one of the highest in the nation and SMS is a popular and simple technology for college students, one would expect a rapid adoption of the technology.

As a member of the university community, the researcher conducted a one-year participant observation of student acceptance of Campus Alerts. The researcher had close access to the physical campus environment, the electronic communication systems (university email, website and Campus Alerts service), the student group and the university’s public safety officials. During the one-year period, the University put tremendous effort into advertising and promoting the alert technology. Advertisements were placed in both paper (pamphlets, flyers) and digital formats (emails, Web pages). The public safety officials also organized campaigns such as "Emergency Awareness Week" in order to increase awareness of the alert service. Despite all these efforts, the adoption rate among students was only 21% by July 2008. From the perspective of TAM, the PU and PEOU of the alert system seem quite obvious because personal safety is everyone's concern in such a high-risk community (“useful”) and SMS is a simple technology for college students (“easy”). Thus, this observation of “apparent absurdity” (Kuhn, 1977, p. xii) poses challenges to our subjective understanding of technology acceptance. In order to resolve the “apparent absurdity” and advance to an interpretive understanding of the phenomenon, a series of qualitative interviews were conducted to explore users’ (students’) perceptions and experiences with the alert system.

**Phase 2: Interpretive Understanding from Qualitative Interviewing**

Using purposeful sampling, a total of 13 students with "maximum variation" (Patton, 1987) were recruited for interviews. The strategy of "maximum variation" attempts to cut across participant variation so that a great deal of information can be obtained from a limited number of participants. The sample included both users and non-users of
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Campus Alerts, female and male, and undergraduate and graduate students from a variety of departments. Of the 13 participants, nine were interviewed individually and four participated in a focus group. The interviews and the focus group were semi-structured, with open-ended questions. The purpose of the interviews was three-fold. First, qualitative interviews provide a holistic view of the alert technology as it is perceived by its users or potential users. A holistic picture needs to be drawn before one can proceed to select interesting theoretical constructs on which to focus the study. Second, the codes and themes developed from qualitative data analysis inform the design of the questionnaire drawn up for the subsequent quantitative data collection. Finally, qualitative data collected from interviews can be used to cross-validate, explain and enrich data obtained through other methods, as such “triangulation between methods” is able to cancel out the bias inherent in one particular method and give us a “convergence upon the truth” (Denzin, 1978, p. 14).

Some key interview questions included:

- Why did you sign up for Campus Alerts?
- Why haven’t you signed up for Campus Alerts?
- Based on what you know and what you’ve learned about Campus Alerts, what do you think about this service?

One thing to be noted here is that the interview instrument was used more as a guideline for conversation than as a rigid questioning protocol. In fact, the interview protocol was being constantly refined as the interviews accumulated. This type of open-ended inquiry allowed me to elicit responses in a non-leading, natural manner (Kvale, 1996; Rubin and Rubin, 2005). The main points covered in each interview were the same, but the wording and order of questions were spontaneous in order to accommodate the flow of the conversation. The length of interviews ranged from 30 minutes to 90 minutes, with an average of 45 minutes. All the interview and focus-group transcripts were imported into the NVivo 7 software program for coding and analysis (Bazeley, 2007). Segments of transcripts were labeled with keywords (codes), and these codes were then categorized and integrated into the evolving coding scheme. If the integration failed, the coding scheme would be revised to accommodate the new codes.

The interviews confirmed that PU and PEOU are central factors in affecting people’s intention of using a technology. However, it was only through the interviews that the researcher clarified what exactly these broad terms meant in the specific use context. Briefly, the thematic analysis of the interview transcripts suggested that a “useful” alert system should be accessible any time anywhere and deliver timely, relevant and the right amount of information. While all interviewees stated that using Campus Alerts was “easy”, they desired a certain extent of controllability, such as over when they received alert messages and what type of messages they received. In a nutshell, this phase of the study gave the researcher an interpretive understanding of what motivated or prevented students from adopting the technology. It became clear that the usefulness of the system depends not just on the general and vague perception of “enhanced safety”, but also on the individual user’s and non-user’s perception of the timeliness, relevance and amount of safety information provided. Similarly, ease of use depends not just on familiarity with SMS itself, but on the extent to which the user has control over the system’s behavior. Consequently, the qualitative data gave rise to a new set of important concepts that might not have been discovered through using “standardized” TAM survey instruments. In other words, the interpretive understanding of PU and PEOU forced the researcher to firmly situate the two core constructs in the use context rather than rushing to utilize any existing instruments of measurement.

Phase 3: Positivist Understanding from a Quantitative Survey

Although qualitative interviewing offered an in-depth view of the local meanings of PU and PEOU, this level of understanding has its limitations. First, the understanding was derived from a very small sample that might not be representative of the population. Second, the qualitative analysis aimed to interpret existing reality (the current level of acceptance) rather than to predict future acceptance. Indeed, generalizability (representativeness of the sample) and “hypothesioco-ductive logic” (predictions from sample) are the very strengths of the positivist approach (Lee, 1991). In order to expand and verify the findings from Phase 2 to the student population, a quantitative survey was conducted following the interviews. The survey instrument included a series of Likert-scale items (with 1 = “Strongly Disagree”, 4 = “Neutral”, and 7 = “Strongly Agree”) adapted from the TAM2 instrument (Venkatesh and Davis, 2000), with newly developed concepts (e.g., relevance of information, customizability of service, etc.) from the interview findings incorporated. Two slightly different survey instruments were implemented: one (35 items) for
current Campus Alerts users and the other (38 items) for non-users. The survey questionnaire (in electronic format) was sent to several university email listservs. A total of 331 usable responses were collected.

After verifying the sampling adequacy with a KMO and Bartlett test, a principal component analysis (PCA) was performed in SPSS in order to identify orthogonal factors that appear to represent the underlying latent variables. The dependent variables were excluded from the PCA (Straub et al., 2004). The PCA resulted in six factors using the default Guttman-Kaiser criterion (i.e., eigenvalue <1.0) and a scree plot parallel analysis. The resulting scale for each of the six constructs was then examined for internal consistency using the criterion of Cronbach’s alpha greater than .70 (Nunnally, 1978). In accordance with this criterion, only factors 1, 2, and 3 were retained in subsequent analyses. For the three factors, each variable loaded highly (greater than .70) on its assigned factor and low (less than .40) on other factors, indicating convergent and discriminant validity of the constructs. Upon examining the items that loaded together, the three constructs were identified as “perceived utility”, “controllability expectancy”, and “subjective norm”. To further test the validity of these constructs, a revised survey instrument was distributed to six randomly selected undergraduate classes. 207 usable responses were received. A confirmatory factor analysis (CFA) of the data in AMOS indicated goodness-of-fit of the model (CFI = .91, GFI = .95, RMSEA = .06). Finally, a series of regression analyses were performed to determine how well the factors were able to predict the user acceptance intention and behavior. In the regression analyses, the dependent variables were students’ behavior (for current users) or intention (for potential users) of joining Campus Alerts, and the independent variables were the three factor scales that were found to have adequate internal consistency. The analysis results showed that “controllability expectancy” (p < 0.01) was a significant predictor of acceptance behavior, while “perceived utility” (p = .181) was not; on the other hand, “perceived utility” was significantly associated with the intention of acceptance (p < 0.01), whereas “controllability expectancy” was not (p = .337). The following section of this paper offers possible explanations of these results in the light of method triangulation.

**Implications of the Case Study**

The sequence, priority and integration of the three phases of research are illustrated in Figure 2 below.

- **Phase 1**: Observations
- **Phase 2**: Interviews
- **Phase 3**: Survey

The design is adapted from the “sequential exploratory design” described by Creswell (2003), except that Creswell’s original model places priority on the initial qualitative data collection. The sequential exploratory design is characterized by the collection and analysis of qualitative data followed by the collection and analysis of quantitative data. In this study, priority was given to the quantitative element and the main purpose of the qualitative element was to assist in forming hypotheses and in triangulating the survey results. The analyses from the three phases were integrated at the stage of result interpretation and discussion.

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3 The associations between subjective norm and dependent variables were weak and are therefore excluded from discussions here.
As previously described, each of the three phases offered a unique perspective for viewing the acceptance problem and our understanding of the issue progressed as different methods brought out different types of data. The “apparent absurdities” of the initial observations were gradually explained by interview findings and then by the survey results. The interview findings helped both in survey development and in cross-validation of results. For example, in the absence of interview data, the survey study might have led to a confusing view of PU and PEoU in predicting the intention and behavior of adopting the alert system. However, by triangulating the qualitative interpretations with the survey data analysis, we were able to reconcile the contradictions and provide a new theorization of PU and PEoU. Specifically, the quantitative study triangulates with the qualitative phase in several ways. First, the factor analysis further confirms that technology acceptance in this particular context centers on PU and PEoU, although these concepts have their specific meanings. Second, the qualitative data help to explain the seemingly confusing results from regression analysis: on the one hand, non-users generally believed that a system like Campus Alerts might be “useful” in terms of improving the University’s emergency preparedness (hence a significant predictor for the intention of acceptance); on the other hand, the existing users had doubts about Campus Alerts based on their usage experiences (relevance, accessibility, etc.) of the system (hence the insignificance of association between PU and behavior). Third, system controllability was a factor identified in both qualitative and quantitative phases, but the quantitative study highlights the critical importance of this factor as a strong predictor of acceptance behavior.

These integrated findings further prompted us to think about the meaning of PU and PEoU in the context of emergency alert systems. Since the “usefulness” of an emergency alert technology is usually assumed but not tried (unless a real emergency strikes), the PU of the technology is inevitably vague (Rogers, 2002). In fact, the lack of “triability” reveals an inherent limitation of many current emergency response systems: the implementation of systems is still grounded on the traditional Command & Control model of crisis management and only functions when there is “chaos” (Wu et al., 2008). Such systems are intended to deal with “chaos” and completely ignore the importance of continuity in emergency response (Dynes, 1994). As Helsloot and Ruitenberg (2004) suggested, existing systems used in daily life are more effective in emergencies than “artificial” response systems. Hence, emergency response systems such as Campus Alerts should integrate more peripheral functions so that continuous use of the system can be guaranteed. For example, Campus Alerts can be used to notify students about unusual events such as school closure and icy road conditions. A system that only deals with future emergencies may be perceived as “useful”, but this future utility might not be a strong motivator for potential adopters. PU, therefore, might refer not only to the central and intended utility, but also to the perceived utilities in dealing with peripheral or even remotely related tasks.

The multi-facet usefulness of emergency alert technologies also links with the technologies’ multi-level ease of use. Although “controllable user interface” (Shneiderman, 1997) is now widely accepted in interaction design, users of emergency alert systems are hardly viewed as active agents with a desire to be in control. In many situations it is true that average citizens have common needs when an emergency strikes; nevertheless, for emergency notification systems deployed in a community with a large number of users, information needs may vary depending on the nature of the emergency and on contextual factors related to the user. Hence, in the case of Campus Alerts, PEoU is an important factor that goes beyond the superficial conceptualization of technical experience or skills. The results of the case study suggest that there are higher levels of usability issues for information technologies which need to be considered when evaluating the ease of use.

Conclusions

This paper describes how a mixed methods approach was used in a case study of technology acceptance. It illustrates four methodological points: 1) the need to advance technology acceptance research by changing the methodological dominance of the survey study; 2) the value of a mixed methods approach in technology acceptance research; 3) the need for evaluation of TAM constructs in both positivist and interpretive paradigms; 4) the importance of method triangulation. Researchers should collect data using different methods and approaches in such a way that the resulting findings from each set of data complement each other in terms of solving the research problems. If findings are corroborated across different methods then greater confidence can be placed in conclusions; if the findings conflict then the complexity of the phenomenon may be appreciated and our understanding of the problem advanced.

No claim is being made that all TAM studies must utilize the mixed methods described in this paper. We recognize the legitimacy of using only quantitative or only qualitative methods and make no claim that the design proposed
here is the best or the only one that can be employed in TAM research. The example study merely provides a demonstration of the feasibility of integrating multiple methods in order to further the theories and understanding of user acceptance of technology. It is also hoped that, by introducing mixed methods into TAM research, researchers will be encouraged to revisit the constructs of PU and PEoU in greater depth so that “actional advice” (Benbasat and Barki, 2007) may be offered to information system managers and system designers.

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References


