APPROVAL SHEET

Title of Dissertation: CITIZEN ACCEPTANCE MODEL FOR TECHNOLOGY
                         MEDIATED SOCIAL PARTICIPATION SYSTEMS

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ABSTRACT

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PARTICIPATION SYSTEMS

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Governments around the world have realized the advantages of engaging their

citizens using social computing systems. However, attracting and sustaining

participation for the greater public good is difficult. While technology is often seen as

solution, it may also be part of the problem. Technology-Mediated Social

Participation Systems (TMSP systems) are a class of information systems designed to

enhance the civic participation process, but studies reveal few sustained successes.

Thus, this dissertation seeks to provide an understanding of the key factors that affect

citizens' decisions to accept and adopt such systems. It extends the literature

throughthe extension and development of an acceptance model fit for TMSP systems.

Additionally, it explores the cultural relevance of these kinds of models by targeting a

non-Western population in the Kingdom of Saudi Arabia. Using a mixed-methods

approach, data were first collected through focus groups and individual interviews to

inform the assembly and extension of the model. Qualitative findings revealed novel

constructs. The resulting model was then empirically validated with a large scale survey of 684 Saudi citizens and analyzed using a Partial Least Square Structural Equation Modeling method. This showed its ability to predict more than 50 % of the variance in TMSP systems acceptance. The overall findings of this research suggest that current technology acceptance models may not suit all contexts. A deeper understanding of the contextual factors is necessary to create a culturally appropriate TMSP systems acceptance models. In addition to the theoretical implications of this research, the findings will practically benefit both governmental agencies and TMSP systems designers by revealing motivational factors for sustained citizen engagement.

Citizen Acceptance Model for Technology Mediated Social Participation Systems

By

Fahad Alayed

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore County, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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Dedication

This dissertation is dedicated to

My wife Aljoharah

My son Nahar

My parents, and my brother Ali.

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Many thanks to all of my siblings, extended family members, teachers, colleagues who prayed for me, and encouraged me to complete this journey.

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1 Chapter 1: Introduction

1.1 Motivation

Throughout all time, governments have a fundamental need to be responsive to the needs of the population that they coordinate. In the most harmonious societies there is a clear conduit of communication between the administration and the governed. This is often through some form of representation or advocacy. The rise of computer-mediated communication has flattened organizations in business and industry, reducing levels of middle-management, and giving a greater number of employees a more direct voice to their leadership (Drucker, 1988). Governments around the world are realizing this potential to more directly engage with their populations, but the track record of e-government civic participation initiatives is difficult. Far more projects fail than succeed. As advancement in affordable mobile computing platforms and infrastructure brings the Internet to the next billion users, this is an opportunity to revisit these kinds of programs and how they are best suited for particular societies. This dissertation will directly address this issue, by understanding potential users' enthusiasm or reluctance to engage in a broad range of direct government communication applications. Key motivations for this research program will be addressed in greater detail in turn.

There are many motivations for this research. The first is the broad impact and benefits of public participation as sustainable development of societies can best be achieved through the involvement of all community members (Le Dantec, 2012). Giving the public an opportunity to influence government decisions from the outset also defuses opposition to particular government actions and builds broad-based

consensus for all government programs as a whole. If the public is involved in the full decision making process, their concerns may be met early on in the planning process when changes may be easier to make, rather than late in the process when even small changes may cost significant time and money. Thus, public participation enhances the harmony of community members; it magnifies the feeling of self-importance and supports the sense of community belonging. This happens when they collectively realize their ability to address and solve their own issues. They recognize that a community's success is tied to their active participation in public life, thus instilling in them a sense of their significance. Derived from this greater sense of community, public participation often has some long-term economic benefits.

The second motivation of this research is that public participation is the best means for a government to leverage collective intelligence, social collaboration, knowledge sharing, and crowdsourcing potential of its population (Brabham, 2012). Each one of these has its benefits on their own, but public participation systems have the potential to take advantage of all of them together. Governments and organizations have realized the power and assets of knowledge that resides in public heads. One way to leverage this knowledge is through public participation.

This kind of public knowledge sharing can be mutually beneficial for citizens and governments alike, especially when the power of the public can replace some of the official channels while improving the quality of information and citizen satisfaction. The citizens would feel better about themselves sharing a piece of information that they know that it will directly benefit their entire community. By recognizing the need for engaging the collective intelligence of citizens, governments will be able to govern more effectively, efficiently and credibly.

The third motivation is the shift in the participation modality to more mobile interaction and virtual presence (Mawela & Ochara, 2013). Nowadays with the help of rapid advancement of information technologies, public participation rarely relies on the traditional ways of participation such as physically attending town halls meetings or calling the agency to report a violation. The field of public participation has been recently enhanced with the adoption of Information and Communication Technologies (ICTs). Among all types of technologies, mobile Smartphones have become the most salient technology, gaining a lot of attention in public participation field.

The ubiquity of mobile phones in general and smartphones in particular has given them an advantage over other technologies to play a main role in facilitating the participation. According to the recent report from the Pew Internet & American Life, as of April 2015, 90% of American adults have a cell phone; and 64% are now smartphone users (up from 58% in early 2014). In a recent Google consumer survey, they found smartphones have become an essential part of people's everyday life (Figure 1.1). They are well adopted by people; however, using these gadgets to participate and engage in their communities is still a challenge. Despite current efforts, Governments around the world should take more advantage of this fact and make smartphones a central part of their strategy to engage their citizens.

The trend now is toward utilizing the mobile technology to better serve the public. Nowadays there are lots of cost-effective technologies that were built to engage citizens in shaping their communities. Many of engagement applications havebeen built to be compatible with a mobile platform that increases their adoption chance.

Figure 1.1 The percentage of the population owning and using a smartphone
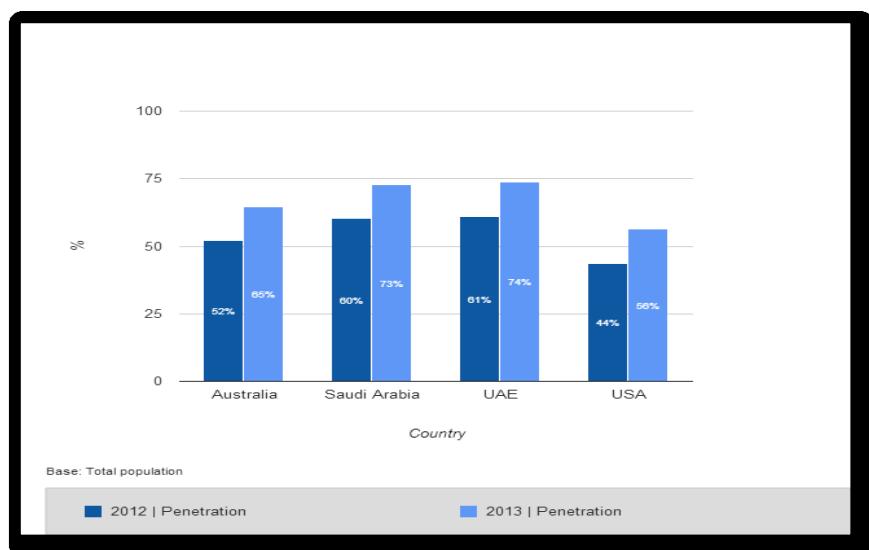
Arming citizens with technologies that allow them to be involved in their communities has valuable benefits in multiple spheres. Networked collaborated societies, improved decision-making process, the trust relation between citizen and governments, and an enhanced sense of community are all encouraging to explore factors ensuring the success of Technology Mediated Social Participation systems (TMSP).

1.2 Technology Mediated Social Participation Problems

Technology mediated social participation is an emerging area of research that "can be harnessed for remarkable social benefits especially as related to national priorities" (Pirolli, Shneiderman, & Preece, 2010). It is built upon principles, such as social participation and collective intelligence that are better established areas in the literature. Although integrating technology more directly in the process of civic participation has countless advantages, it has another side too. In this section, I will introduce some of the challenges that impede the acceptance of TMSP systems.

The first challenge for this type of systems to thrive is to have a large number of collaborators and contributors or what Computer Supported Cooperative Work (CSCW) researchers have called "critical mass." The lack of critical mass is usually the main reason many public participation initiatives fail regardless of how many resources have been used for its success.

Users first need to accept the notion of the technology to later adopt and use it. Thus, the fundamental problem of how to make TMSP systems socially usable and acceptable and how can we motivate people to use these applications to contribute knowledge for the public good? The focus then is how to make the participation technology channels acceptable by the public to encourage greater participation. Traditional system usability has focused on creating efficient interfaces and systems that are simple to use for individuals. Although this is important for all ICT design, just because a system is easy to use, it will not necessarily attract and engage users.

Another problem in the TMSP systems research area is that researchers have privileged the technical part of the TMSP systems over the social side of these

systems. Developing applications that are very usable technically will not guarantee success for these applications. TMSP systems designers should pay attention to social needs and the wider set of factors that would attract a sustained critical mass of users.

Understanding how to increase the motivation for participation is a deep science question that will occupy researchers for many decades (Shneiderman, 2010). The fundamental activity of users in TMSP systems is participation. It begins with motivation and the acceptance of technology. However, the concrete factors which lead individuals to accept and continue using a given technical system that allows users to participate with each other are less obvious (Marshall, 2010). So in short, the first big challenge is related to user motivation, acceptance, and adoption of TMSP practices and systems.

The second challenge is the lack of studies that consider the user/citizen as the unit of analysis. In the electronic government literature, which meaningfully overlaps with the participation literature, most of the technology acceptance and adoption studies have focused on the organization or government agencies side and neglected the actual citizens. There is increasingly more research that examines the adoption of e-government in relationship to citizen demand (Reddick & Norris, 2013). Some studies emphasize the importance of understanding the citizens side (Gauld, Goldfinch, & Horsburgh, 2010; Reddick, 2005). Moreover, despite the extensive body of information systems research in user acceptance of technology (Davis, 1989; Venkatesh, Morris, Davis, & Davis, 2003), there is a little coverage of the adoption of TMSP systems. Although acceptance and adoption usually are used interchangeably, they are not the same; acceptance and adoption are correlated but not equal. Technology adoption is "a process starting with the user becoming aware of the

technology, and ending with the user embracing the technology and making full use of it" while acceptance is the user attitude toward the technology before using it (Renaud & van Biljon, 2008).

Clearly there is a need to take the citizen perspective into consideration when studying adoption in the TMSP domain. Not only focusing on citizens, but taking into consideration the cultural impact and context when investigating the acceptance factors of such systems.

In addition, there is a general lack of theory in TMSP domain, which posed as another motivation for this research. Lewin has a famous phrase: "There is nothing so practical as a good theory" (Lewin, 1964).Theories add practicality for research because they arm the researcher with explanatory power of phenomenon. They allow for a better understanding of why things happen and provide frameworks that guide research and help explain results.

> *Theories are an important component of scientific research. Theory should play an important role in the science of TMSP systems and their design. A theoretical basis for TMSP can explain why some systemssucceed, and others fail, provide a basis for simulating activity in existing TMSP systems, and aid in predicting whether a new TMSP system will succeed. In addition to providing a framework for identifying important aspects of TMSP design, working from a theoretical basis can help develop a common understanding when applying TMSP to solve complex problems in areas such as health, education, sustainability, and government. Developing relevant theories that help determine how to achieve positive outcomes is essential for advancing our understanding of current and future TMSP systems.(Kraut et al., 2010).*

Indeed, without a culturally appropriate model or theory that can predict the acceptance factors of TMSP systems and guide their design, the success of these emerging technologies will continue to be nothing but pure luck.

1.3 Objective of the dissertation

The main objective of this dissertation is to explore and gain a better understanding of the key factors that motivate the acceptance of TMSP systems in the context of Saudi Arabia. This objective will be achieved through:

- The identification of factors (technical, social and contextual) that influence the acceptance and usage of technology-mediated social participation tools.

- The development of an integrated theoretical model that lends itself to studying the adoption of technologymediated social participation systems to determine the most important factors that influence and motivate the adoption.

- The ongoing focus on TMSP systems from the citizen's perspective.

The findings of this research have both practical and theoretical contributions that will help guide the design and implementation of more acceptable TMSP systems.

1.4 Scope of the Dissertation

The primary field to which this dissertation will contribute within Information Systems is e-governance, also known as digital government. The dissertation has a clear scope and boundaries. Social Participation is an umbrella term that covers many concepts that vary based on context and domain. It is important to state that the intended meaning of this term in this research is related to the use of TMSP systems for the public good with particular focus on incident reporting systems.

Public good can be defined as service provided for society without profit. This domain includes: reporting a violation, community policing, and contribution to traffic maps, participating in finding a missing child, and many other applications. Previous research focused on factors that affect the TMSP systems acceptance in the public policy domain, while this dissertation aim to uncover the factors affecting TMSP systems acceptance in the public good domain. Another boundary of this dissertation is related to the targeted population. This research on the adoption of TMSP systems will leverage a case study approach with a focus on citizens of the Kingdom of Saudi Arabia.

1.5 Overview of Research Design and Plan

As described in detail in Chapter 3, the research design will be a two-phase, mixed methods investigation that results in a case study. The design is adapted from the sequential exploratory design (collection and analysis of qualitative data followed by the collection and analysis of quantitative data) as follows:

The first phase aimed to explore motivational factors through conducting individual and group interviews to explore public perceptions, attitudes, and opinions regarding TMSP systems. This was to identify motivational factors that may affect the acceptance of these participation technologies. This investigation began with a series of focus groups to collect data that would inform the design of culturally-relevant constructs. Some of these described novel factors which were added to the list of common factors identified from the system acceptance literature.

The second phase of this study explored the relationships between the factors and the public's intention and/or action. Thus my emerging adoption model was

validated by using a large-scale survey to gather data about the public's motivations for use (or non-use) of TMSP systems. The survey instrument that I used in phase two, was designed based on the results acquired from phase one of the research (see table 1.1)

Goal	Research Question	Research Method	Output
Phase 1: Qualitative • Identify motivational factors to use TMSP systems in the public good domain. • Develop a TMSP systems acceptance model.	Research Question: What are the key factors that influence the acceptance and use of TMSP systems?	Literature Review + Focus Groups + Individual Interviews	• A set of key motivational factors from literature. • Contextual facilitators and barriers of accepting and using TMSP systems. • An initial model of TMSP systems acceptance.
Phase 2: Quantitative • Empirically test the model developed in Phase 1. • Examine relationships between identified factors and usage intention of TMSP systems.	Research Question: How are different motivational factors associated with the intention of using the TMSP systems?	Large Scale Web-based Survey	• A set of relationships between motivational factors and Usage intention of TMSP systems. • A validated model of TMSP systems adoption in the domain of public good.

1-1 Research Design Overview

1.6 Overview of the dissertation

The remainder of this dissertation is organized as follows:

Chapter 2: Literature Review

      This chapter reviews the related literature including the concepts of public participation, TMSP systems, and public good. It also provides an overview of the two main technology acceptance models and reviews some previous studies that investigated motivation and acceptance in similar systems. Then it describes the study site of Saudi Arabia and gives insight on the social and cultural setting in that country. Finally, the core research questions are presented.

Chapter 3: Research Methodology

      This chapter describes the research design and the rationale behind it. It explains the sampling strategy, data collection, and study execution. The analysis and validation of the data collected will also be discussed. Because this research is conducted by adapting a mixed methods approach, the chapter ends with the discussion of meta-inference and data quality.

Chapter 4: Model Construction

      This chapter tells the story of the qualitative data collection, including the focus groups and follow on interviews and reports their results. The results of this field work inform the modified design of an acceptance model. This chapter will also describe the model's constructs and the hypotheses development processes.

Chapter 5: Model Validation

This chapter reports the findings of the large scale survey that has been used to test the TMSP systems acceptance model that was built in chapter 4. Through the use of Structured Equations Modelling, the research hypotheses results are reported for the full study sample. This chapter concludes with a hypotheses testing comparison for TMSP systems users and non-users.

Chapter 6: Discussion

This chapter discusses the results reported in chapter four and five by using the bracketing and bridging approach. The discussion of the results will be in the form of meta-inference of the two strands of studies conducted. Moreover, an integrative view of findings from qualitative and quantitative strands of mixed-methods research will be discussed.

Chapter 7: Conclusion

This chapter provides a summary of the dissertation' major contributions, including both theoretical and practical implications, and a discussion of the limitations of the research. This chapter concludes by offering some insight into the directions for future research.

Chapter 2: Background

This chapter first introduces the concept of participation. Then, the chapter reviews the extant theories and models developed to explain individuals' acceptance of new technologies. These theories and models provide a foundation for building the research model in this dissertation. Next, the chapter will give a description of the study main site and its cultural context. Finally, this chapter proposes research questions of this dissertation study.

2.1 Public Participation

Public Participation can be defined as "collective activities that individuals may be involved in as part of their everyday lives. This might include: being a member of a community group, a tenants association or a trade union; supporting the local hospice by volunteering, and running a study group on behalf of a faith organization. Others have variously called this kind of social engagement 'associational life, collective action, or civil, horizontal or community participation" Brodie et al. (2009). A varityof terms isused to describe public participation. Creighton (1981) discussed such variety as follows:

> *During the 1960s and 1970s there was an explosion of programs under the names of 'citizen participation', 'public involvement',' community involvement', 'citizen involvement' and so forth. Although some people have argued that the variation in these terms represent distinctions about the degree to which the public is an integral part of decision making, I think these distinctions are semantic quibbling. What we are talking about is including (involving, consulting, inviting the participation of) the public in the important decisions of government or corporate entities. (Creighton, 1981, p.vii)*

Creighton's position highlights the importance of the activities rather than the notion of participation variations. In each of its variations, public participation has positive impact in various levels (economic, environment, education). One of the benefits of enabling the public participation is the relationship connection between government agencies and their consistencies. This partnership allows for better understanding of community problems and enables two parties to work together in solving community problems. (For more on the benefits of public participation, see chapter 1).

The degree of interactivity between the public and their government has been practiced in ways that range from an entirely passive mode to full interactivity and empowerment. For example, Arnstein(1969), adopts an eight-fold division of citizen's participation. Her proposed typology "the ladder" starts with a "non-participation level that has two rungs (manipulation and therapy) and ends with citizen power with high most rung as citizen control (Figure 2.1).
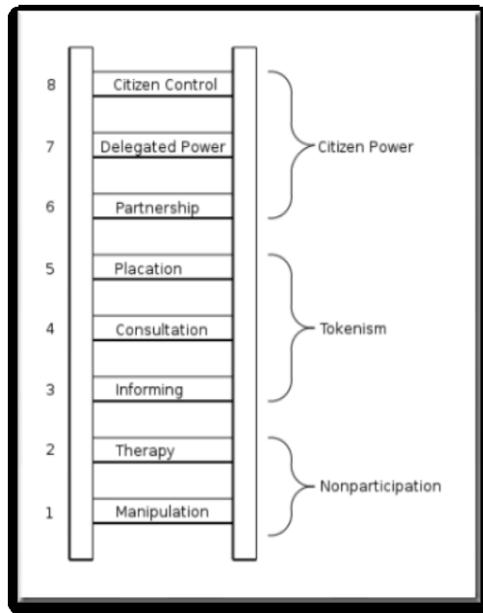
FIGURE 2.1 Ladder of Citizen Participation

Bucy and Gregson, (2001) introduced a rather different model which consists of three modes of citizen participation (active, passive, inactive). A third model that was built to classify the participation's level and it focused on computer-supported participation, was constructed by Preece & Shneiderman (2009) call the Reader-to-Leader framework. Their model identifies the following levels of participation: all users, readers, contributors, collaborators, and finally leaders. The Reader-to-Leader frame was introduced to explain the level of participation in online communities, but it has potential to be applied in other domains such as public participation in different domains and several cultural contexts. All these three models are relevant to the study at hand in which they can be used to decide the current level of participation among the study's participants. For instance, if Bucy and Gregson's model applied to this study, then based on the study's findings (see chapter 5) the current level of social participation is inactive. This finding will raise the awareness among governmental

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agencies to intensify efforts needed to involve citizens in order to increase the level of participation.

Renn, Webler, and Wiedemann, (1995)found that diverse cultural and social contexts impact what lives up to expectations and what does not work in adopting a participatory approach to the decision-making process. Therefore, to enhance the opportunity of success for implementing a particular participatory model in a particular context, such a model has to be thoroughly studied and tested while taking into consideration the circumstances of such a context. In the context of Saudi Arabia, applications and research about the adoption of participatory actions and technologies that are mediated by technology in the public good domain are rare which calls for more research in this area.

As discussed in Chapter 1, social participation at its core is an ancient activity that has been practiced in societies for ages. However, utilizing ICT to carry out this activity is a relatively recent practice. The next section will discuss the social participation that is mediated by technology.

2.1.1 Technology-Mediated Social Participation Systems

Technology has a great potential to capture the local knowledge of the community members. It can also provide a convenient, reliable channel to engage the public in their community and increase their participation. Howard (1998), has mentioned a number of Internet advantages over strictly physical participation: the meetings are not constrained by a place or time, but available 24 hours a day, seven days of the week. Such availability enables participation at any time as long as the Internet is accessible and so opens up opportunities for more people to participate in public consultations. These advantages of the Internet to public participation are applicable and offered by mobile technologies. On the contrary, limiting participation to the technical channels may empower those with access to technology and simultaneously widen the digital divide.

Despite the digital divide concern, public and social participation admittedly can be enhanced by employing a piece of technology. In this dissertation, mediating technologies refers to the technical systems that participants use to engage and involve in their community. Specifically, mobile technologies that are used to facilitate the participation process. Mobile and smartphone users already engage in a wide range of participatory activities such as reporting traffic congestion, entering competitions, taking and distributing photographs, or spreading news of different events (Vincent & Harris, 2008).Mobile phones have definitely created new ways in which citizens can participate. The focus of this study is the acceptance and adoption of these participation systems that are mediated by mobile technology.

2.1.2 Motivation in Different Public Participation Domains

Public Participation takes various ways and span over diverse domains. Levels of involvement and degrees of participation also differ among domains based on the nature and context of participation process. Some of the domains that currently utilize the TMSP approach are: knowledge sharing, online communities(Kuznetsov, 2006),citizen science(Rotman et al., 2012),and crisis informatics(Cobb et al., 2014). In all of these, public participation is still an evolving field of research which can be difficult to classify.

Previous studies have investigated the incentives of public participation in different domains, but motivational behaviors are complex and not always obvious. While there are many digital government initiatives to engage the citizenry, most research on the topic has been done with citizen science. This is a very different kind of public participation and knowledge sharing practice. Citizen science projects enable non-scientist citizens to contribute to scientific research by collecting data and reporting their observations. The main goal of such systems is to advance the scientific knowledge. On the other hand, the TMSP systems aim to solve civic issues that pertain to public's daily life. This distinction in the core activity and purpose of these two domains suggest different motivations and incentives for participation.

Collaborative knowledge creation is at the heart of public engagement and participation. In the current information age, it is a fact that knowledge is expensive, so in order to obtain it from the collective public, government organizations may need to incentivize citizen contributions and participation. I argue that it is important to understand some of the participation models that inform this behavior.

In the Reader-to–Leader model of participation (Preece & Shneiderman, 2009)the researchers showed the transition of users from being a passive lurker to a contributor then to an active collaborator and finally becoming a leader. Although this model was examined in the context of contributions to online communities, it has the potential to be applied to the collaborative relationship between organizations and public.

Another incentive approach that is extensively applied in citizen science is gamification. Citizen science projects are attracting the public through creating game-like applications for knowledge contribution with public reward systems(Iacovides, Jennett, Cornish-Terrestrials, & Cox, 2013). Although, citizen science is not the focus of this study, it is the most relevant domain with a rich literature in motivation.

Citizen Science researchers have tackled the questions of how to motivate the public to remain involved for a long time. Nov et al.(2011)argued that motivation is very important to the success of a citizen science project; they believed citizens' motivation is a pillar for any citizen science project. Understanding the incentives behind participation in citizen science projects is essential to their success, especially when there is evidence that contributors often reduce their involvement after a period of time (Rotman et al., 2012). The same argument can be applied to this study's focus, as TMSP systems and citizen science projects share many characteristics; it is expected that motivation and incentives will play a major role in TMSP systems success.

One example of the studies that looked at motivation for public participation in the citizen science domain using technology was conducted by Raddick et al. (2009). They identified the motivational factors in Galaxy Zoo; an online astronomy

site which invites members of the public to assist in the morphological classification of large numbers of galaxies. As a preliminary technique to understand the motivations of the volunteers, the study's team initiated a new post on the site forum titled "What Makes Galaxy Zoo Interesting?"They got 826 responses for this question and people explained and listed the reasons behind their volunteering in this citizen science project. Following the forum survey, the team interviewed 22 participants who were recruited through the Galaxy Zoo emailing list. They found trends and categories of 12 motivational factors. The majority of the categories (64% of them) were about the core activities of the project, but the remaining included things such as learning, help, and aesthetics.

This study brings attention to numerous factors that can affect public participation to engage in such process. However, I argue that this study does not identify the factors to accept the technology that facilitates the participation; rather it just looked at the reasons behind general participation acts. Although, it is useful and important to understand factors underpinning general participation, it is equally important to understand the acceptance factors of facilitating technology.

The work by Nov et al. (2011) uncovered the motivations to participate in different citizen project SETI@home which is a platform to analyze radio signals, searching for signs of extra-terrestrial intelligence. They tested seven theories and identified four individual motivations that stemmed from the benefits for the project or the participant (Enjoyment, Reputation, Values; and Enhancement). Their study has also revealed that collective and intrinsic motivations are the most salient motivational factors, whereas reward motives seem to be less relevant. The same limitations of the previous study exist too.

Motivation is a complex behaviour. Thus no single approach may work for all citizens in all contexts. In finding the right fit, it may be useful to explore multiple theories, possibly in combination. One of these is *Expectancy theory* by (Vroom, 1964), which is the notion that motivation relies on expectations of positive outcomes. This implies that the public would be more eager to participate when they expect positive result from their participation.

Expectancy theory can inform the design of systems to share knowledge between organizations and the public to improve the likelihood of sustained public engagement. Simply, the public is more apt to share when they know that their efforts are appreciated by the organization and can bring about change. The positive expectations understandably differ from one system to another, but the argument is that the organization should incentivize the public to collaborate in creating knowledge via ensured positive outcomes upon their participation. Other motivation theories should also be examined to advance models that inform the design of systems to attract public participation. This study at hand will integrate the expectancy theory in acceptance model as it will be discussed in chapter 4.

In summary, TMSP systems facilitate public participation in different domains. Although the literature on acceptance of these systems that are used for the public good and service improvement is scarce, I presented some of the studies on the next closest domain, citizen science. In next section, I will focus on the core domain of this research which is the TMSP systems that are developed to engage the public in their community in the domain of service improvement and public good.

2.1.3   TMSP systems for Knowledge Sharing and Self-Reporting.

The focus of this study, as previously mentioned, is the TMSP systems that are designed for the public good. These kinds of systems are well accepted in Western countries, but not as well accepted in countries such as Saudi Arabia. These systems are usually developed to utilize mobile smartphone platforms. These offer an immediate and contextual medium for participation. They are equipped with a camera, and a built-in GPS locator that make them very useful. The ability to capture a picture and declare the location makes participation though Smartphones much easier and more effective. Public service improvement has many different forms of applications. Community policing, crime prevention, neighbourhood maintenance, and incident reporting are just few examples (Brush, Jung, Mahajan, & Martinez, 2013; King & Brown, 2007).

One of the early incident reporting applications that is widely used by the public is the FixMyStreet mobile application. This system is one of the first for citizen-driven public service improvement. It allows citizens of the United Kingdom to report issues, such as illegal garbage dumping or broken streetlights. The reported problems are submitted to the appropriate local council by the service (See Fig 2.2)(King & Brown, 2007).
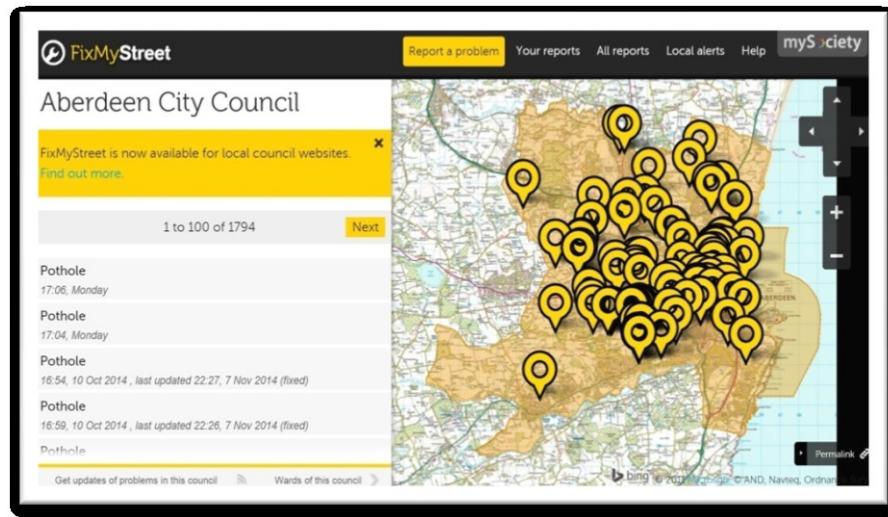
FIGURE 2.2 Snapshot of FixMyStreet

Another example is Balagh Tejary, (بلاغ تجاري) which literally translates from Arabic to mean "commercial report". This application is designed to arm the citizen with a tool to report shop violations or cheating. It allows a citizen to fill out a simple form, attach a picture, and use GPS to determine the location of the violation. These applications are not new and have been used in many different domains; however, attracting citizens to try them first and then sustain their use remains a challenge (Figure2.3).

FIGURE 2.3 Snapshot of BALAGH Tejary

2.2 Technology Acceptance

Technology acceptance is defined as "an individual's psychological state about his or her voluntary or intended use of a particular technology". It is one of the most investigated research areas in Information Systems (IS). In fact, the most cited paper in the IS field is the one that introduced the Technology Acceptance Model (TAM) by Fred Davis in 1989 (Venkatesh, Davis, & Morris, 2007). There are several theories and models that were developed to explain and predict the acceptance and adoption of new technologies. In the next section, I will briefly describe two main models: TAM as it represents the kernel of technology acceptance research and the adapted model for this study the Unified Theory of Acceptance and Use of Technology (UTAUT)(Venkatesh et al., 2003a).

2.2.1   Technology Acceptance Model (TAM)

The TAM is founded upon the hypothesis that technology acceptance and use can be explained in terms of the user's internal beliefs, attitudes, and intentions. According to Venkatesh, the TAM postulates that an individual's behavioral intention to use a piece of technology is determined by 1-Perceived of Usefulness (PU), and 2-Perceived Ease of Use (PEU)(Venkatesh, 2000).The perceived usefulness is a measure of how much a person believes that using technology would improve their job performance whereas the perceived ease of use is a measure of how an individualperceives the effort to learn a new technology(figure 2.4).
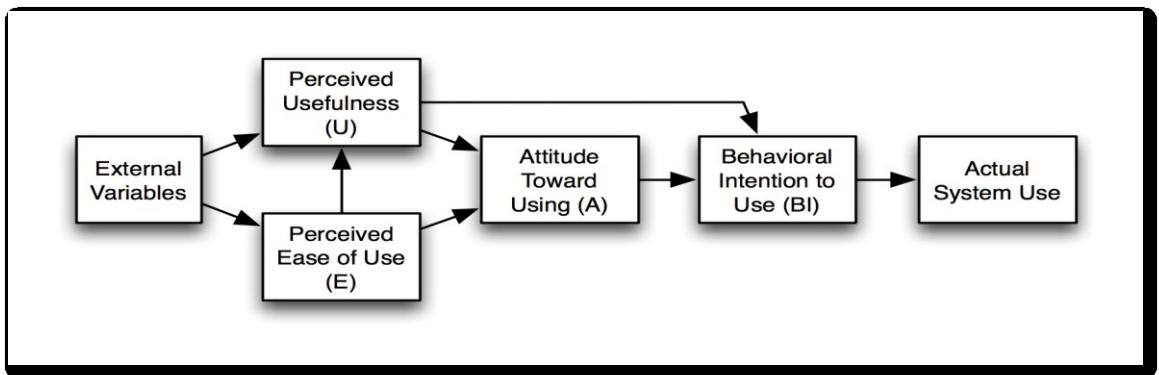
FIGURE 2.4 Technology Acceptance Model by Davis (1989)

Despite the widespread use of TAM in adoption research, some scholars have criticized it and claimed that TAM is overused (Benbasat & Barki, 2007). This overuse has caused what Straub referred to as a "dominant but stifling paradigm" (Straub & Burton-Jones, 2007). However, this overuse of one model does not limit researchers' exploration of other models and theories that could better predict the adoption and usage motivations of new technologies (Goodhue, 2007).

One of TAM's shortcomings is that it neglected the influence of social and control factors on behavior despite the fact that these factors have been found to have a significant influence on IT usage motivations(Dillon & Morris, 1996; Taylor & Todd, 1995). Another criticism is that the TAM is usually validated by using a measure of behavioral intention to use rather than actual usage. Turner's study has extended the work by Legris et al. (2003) of the relationship between TAM variables and actual use. Their systematic literature review's results show that the behavioral intention is likely to be correlated with actual usage. However, the TAM variables are less likely to be correlated with actual usage. Due to these limitation and criticisms, TAM will not be used directly in this study. In the next section, the more developed UTAUT model will be introduced as the adapted model for this research.

2.2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model (figure 2.5) was developed as a unified model that integrated constructs from eight different models. Venkatesh et al. (2003) empirically tested and validated the UTAUT model by merging eight distinct technology acceptance models based on their similarities. The models that yielded UTAUT include the theory of reasoned action (TRA) (Ajzen & Fishbein, 1980), the theory of planned behavior (TPB) (Ajzen 1991), the technology acceptance model (TAM)(Davis, 1989; Davis, Bagozzi, & Warshaw, 1989) , the motivational model (MM)(Davis, Bagozzi, & Warshaw, 1992), the combined theory of planned behavior/technology acceptance (TAM-TPB)(Taylor & Todd, 1995), the model of PC utilization (MPCU)(Thompson, Higgins, & Howell, 1991), the diffusion of innovation theory (IDT) (Rogers, 1995), and the social cognitive theory (SCT)(Compeau & Higgins, 1995).
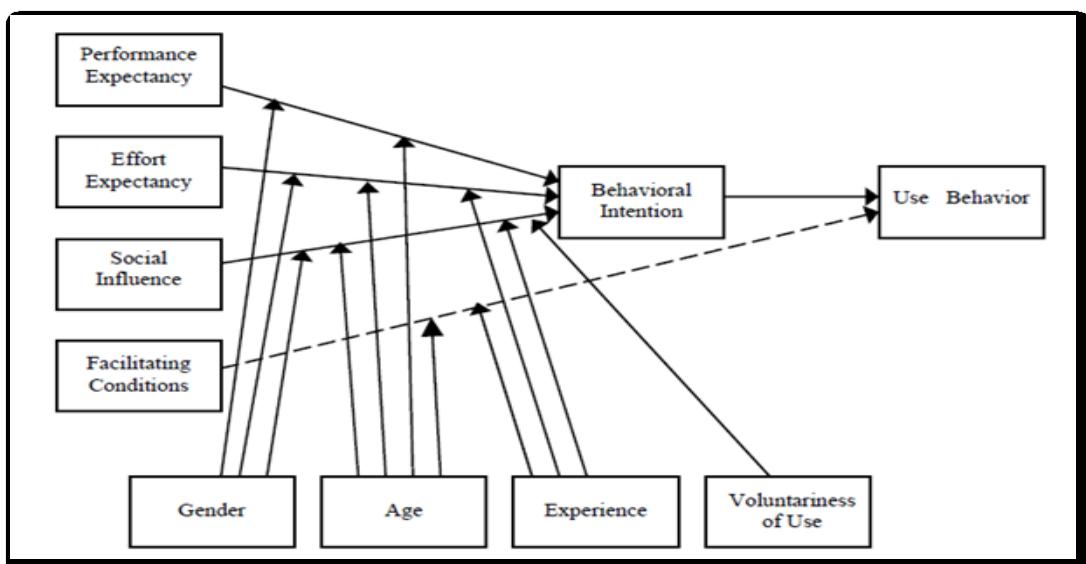
FIGURE 2.5 Original UTAUT model by Venkatesh (2003)

Since its inception, scholars have used UTAUT to characterize usage motivations and predict technology adoption in different contexts. Researchers have stressed the importance of revalidation and extension of the acceptance model in general and the UTAUT model in particular (Berthon, Pitt, Ewing, & Carr, 2002; Silva, 2007). Accordingly, UTAUT has been extended and revalidated in several domains and contexts such as Healthcare (Kijsanayotin, Pannarunothai, & Speedie, 2009; Kohnke, Cole, & Bush, 2014; Liu et al., 2014), Mobile Banking (Oliveira, Faria, Thomas, & Popovič, 2014; Zhou, Lu, & Wang, 2010), E-Government (AlAwadhi & Morris, 2009; Alshehri, Drew, & AlGhamdi, 2013), and Social media (Escobar-Rodríguez, Carvajal-Trujillo, & Monge-Lozano, 2014; Salim, 2012).

In a recent study, Van Belle & Cupido (2013)adapted the UTAUT model to determine the key factors that influence public participation intentions in South Africa's local government via mobile phones. Of all the UTAUT variables tested, the only two statistically significant drivers for the intention to participate in M-government were found to be the Performance Expectancy construct and the Effort Expectancy construct. Their finding suggests adapting and validating the model in different countries as culture could impact the adoption factors of new technologies. A study by Gupta et al.(2008) found UTAUT to be a valid model to help understand the adoption and successful use of technology in developing countries. Oshlyansky et al.(2007) supported previous research; they collected data from nine countries around the world to validate the UTAUT cross-culturally. They concluded that the UTAUT model can provide an insight into cultural differences and values in terms of technology adoption and use.

Despite the number of studies that validated the model in different countries, UTAUT has been mostly validated in North American contexts. Clearly, in contexts removed from Western nations, the impact of subjective norms on the individual and organizational acceptance of IT could vary significantly (Al-Gahtani, Hubona, & Wang, 2007). UTAUT's strength, inclusiveness and appropriateness to different contexts, cultures and countries as studies have found, have made it the most suitable technology acceptance model for the study at hand. Given the context of this study is the Arabic culture of Saudi Arabia, some additional detail about the country and its dominant cultural forces is required. The following section will shed the light on these details.

2.3 Saudi Arabia

The Kingdom of Saudi Arabia (KSA) was established by King Abdul-Aziz Al-Saud on September 23, 1932.With a population of approximately 31 million people (2015), Saudi Arabia is the largest country in the Arabian Peninsula and is approximately one-fourth the geographic size of the United States of America (830,000 square miles). KSA is geographically located in the southwest boundary of the Asian continent. Islam is the religion of all Saudi citizens (Saudi Ministry of Foreign Affairs, 2004). The Kingdom's judicial system is based on Islamic Shari'ah (Islamic law), which has its roots in the Holy Quran and the teachings of Prophet Mohammed. Religion is a significant factor in KSA and the country does not separate it from state operations (Metz, Library of Congress, & Federal Research Division., 1992); as such the Quran is considered to be the country's constitution. The Kingdom inherited a rich history of civilization that shapes the culture and society of Arabian

Peninsula. Religion in particular, as a part of the national culture, plays an important role in setting the social norms, patterns, traditions, practices, and daily activities of Saudi society(Al-Saggaf, 2004).

In order to understand the acceptance and adoption of new technologies in Saudi Arabia, it is important to consider the full national context of the country. Saudi culture is determined by various unique aspects that distinguish it from other countries. It is traditional, socio-centric, and male-dominated(Ikhlas A.H. Abdalla, 1997). One cultural factor that profoundly impacts all social and public life in the country is gender segregation. The segregation of males and females is a cultural dimension that is very specific to the culture of Saudi Arabia. In addition, Arab societies in general are collective cultures, which encourage dependence on family members and friends (Hofsted, 1984).

Understanding the cultural values and dimensions for this study's targeted population, Saudi citizens, is crucial in identifying the key factors that influence the acceptance and adoption of technologies.

2.3.1   Technology Acceptance in Saudi Arabia

Before discovering and extracting oil, Saudi Arabia was one of the poorest countries on the planet. Most people were living in tribes and following the rainfall across the desert to survive. There was no infrastructure and most parts of the country slept at sunset due to the lack of electricity. Nowadays, Saudi Arabia is one of the major oil producers, and it is regarded as one of the richest countries in the world. It is well on its way to become an economically developed country instead of its current status among developing countries. Currently, the stability of the Saudi Arabian economy has contributed to making it one of the thriving countries. The huge growth

in Saudi's economy has raised the demand for ICTs. For example, smartphones and tablet devices are becoming increasingly popular in the Middle East. Saudi Arabia currently leads the Middle East in Smartphone penetration, achieving a level of 75%. However, due to the nature of Saudi culture and society, not all of the introduced technologies were welcomed. In fact, research shows that Arab countries have higher resistance and lower acceptance rate of new technologies(Sait & Al-Tawil, 2007). The ICT infrastructure in Saudi Arabia is under continual improvement. Abanumy et al.(2005), have conducted a study to investigate the low rate usage of internet in Saudi Arabia. Although this issue is not the focus of this study, other socio-cultural and socio-technical issues that affect the acceptance of the internet, may also be related to the acceptance and usage of TMSP systems. Straub et al. (2001) argued that the reluctance to accept the technologies in the Arab world stems from strong affinity of Arabs for their cultural beliefs and values.

Rose and Straub (1998)conducted a study of IT adoption and use in the Arab world. Using a cross-sectional survey of 274 knowledge workers in five Arab nations (Egypt, Jordan, Saudi Arabia, Lebanon, and the Sudan), they applied a modified TAM to assess the diffusion of personal computing. Their model explained 40% of the variance of personal computer use in these nations. Subsequently, Straub et al.(2001)developed a cultural influence model and suggested that Arab cultural beliefs were a strong predictor of resistance to IT transfer. Despite the aforementioned studies, research that explains the motivation and acceptance of TMSP systems in Saudi Arabia is rare. This present study is needed to investigate the acceptance factors of this class of information systems, with a focus on culture impact on these factors.

The promising benefits of TMSP systems balanced with the limited understanding of the acceptance factors for such systems and the lack of a culturally appropriate model to help predict the acceptance, demands further research in the unique context of Saudi Arabia.

In the following section, I will present the research questions that I am aiming to answer through this research.

2.3.2 TMSP systems for Incident Reporting in Saudi Arabia

Saudi agencies are keeping pace with global interest in incident reporting systems by introducing a number new mobile reporting applications. In 2014, there was only one application that was designed by the Ministry of Commerce (Balagh Tejary) to report violations by shops, but today there are at least four new applications that are starting to gain a momentum in the Saudi society. Unfortunately, the surge in developing and designing incident reporting applications does not mean they are well accepted and used by the public, however it shows the increase in awareness and the desire of these agencies to engage citizens in their communities. Examples of these applications that were recently developed are: *1-Lama Application (تطبيق لمى), 2-* *4-. (تطبيق كلنا أمن) Kollona Amn 3-,(تطبيق بلاغات المياه) Water Friends application* *Amanah application (تطبيق أمانة الرياض).* Each of which will be briefly described here.

1-Lama Application:

Lama is a little Saudi girl who became well-known after the unfortunate incident of her falling into an uncovered abandoned well which led to her death. This app named after her and can be used to report any uncovered water well or sewage cesspit to the government. With the built in GPS, the citizen will be able to precisely locate the uncovered well which will help in solving the problem. (Figure 2.6).
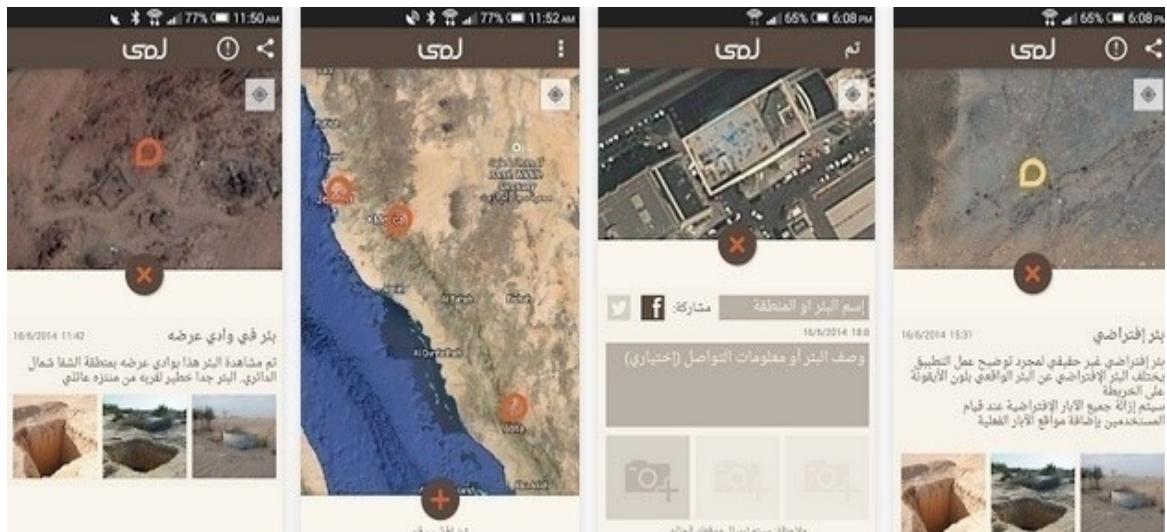
FIGURE 2.6 Snapshot of Lama mobile app

2- Water Friends Applications

This application is designed to involve all citizens as well as the National Water Company's officials and staff in monitoring water use. It aims to increase the awareness of the community of the waste of this valuable and rare resource in Saudi Arabia. It focuses on reporting leaks and abusive use. The application has several advantages; most importantly, identifying the reporter's location and the ability to attach an image to the report. It also allows the citizen to write a short explanation for the case to be reported, noting that the application saves the time and date immediately after sending the report. It automatically sends this information to the teams associated with the follow-up and those who are in charge of fixing the problem

FIGURE 2.7 Snapshot of Water Friends Mobile app

3-Kollona Amn

Kollona Amn is an application that was launched my Ministry of Interior in Saudi Arabia in 2016. Its idea came from the "See Something, Say Something" crowd sourced security campaigns. This application enables all citizens and residents in Saudi Arabia to play the role of a police officer which speeds up rescue missions and reduces damages and losses. Citizens and residents can send an incident by attaching a video, photo, or audio note. In addition, citizens will receive updates on the status of their incidents.

3-Amanah Application

The emergency center in Riyadh, the capital of Saudi Arabia, created this mobile application to serve the residents of the city in order to provide a convenient channel that contributes to the delivery of complaints that pertained to the city public spaces. This is the Saudi version of the British TMSP application (FixMyStreet). By using this application, Saudi citizen are able to report potholes on streets, fallen trees, and other public properties damages (Figure 2.8).
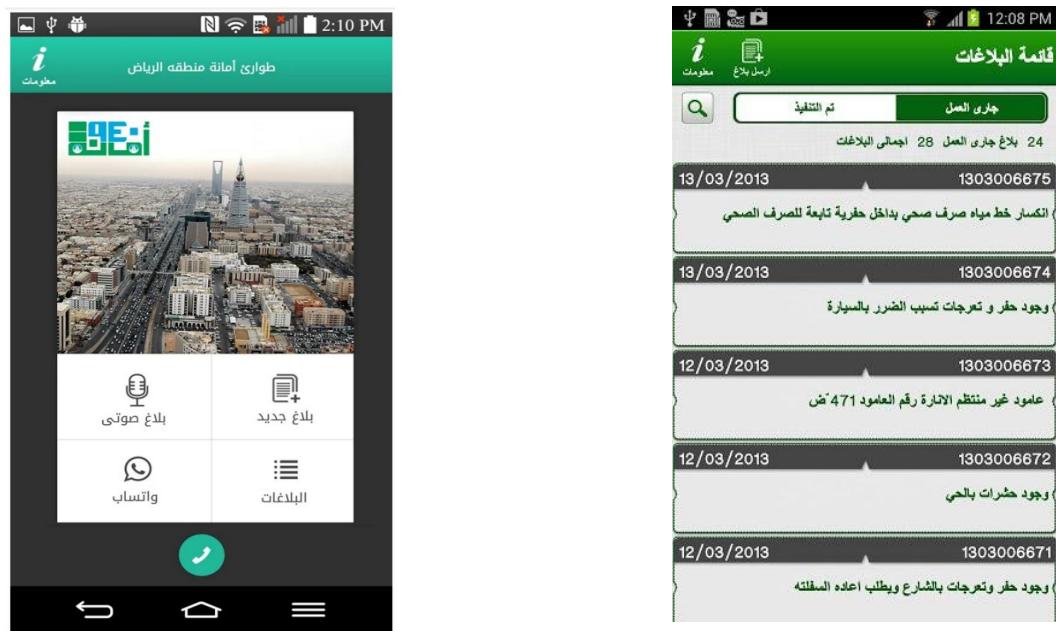
FIGURE 2.8 Snapshot Of Amanah Mobile App

While a growing body of literature has studied participation as a means of facilitating greater citizen participation, little is known about the driving forces behind active citizen participation. Moreover, most of the literature concerns the participation via personal computing and the internet. Research that aims to identify the factors that motivate the public to accept these participation systems on mobile platforms is indeed needed.

In the previous sections of this chapter, I introduced the concept of public participation; I reviewed the TMSP systems and the motivation for general participation in one of the TMSP domains. In addition, I briefly focused on the reporting incidents for public good domain and gave examples of the few available TMSP systems in study site Saudi Arabia. To serve the goal of this study, in the next sections, I will review the classic technology acceptance to help understand the factors that impact the acceptance and adoption of TMSP systems. Following that a

description of the study site, Saudi Arabia, studies of cultural appropriate technology acceptance models there, and a brief recap of existing reporting systems were given.

2.4 Research Questions

Based on this review of the literature, it can be inferred that studies of TMSP systems acceptance in the Kingdom of Saudi Arabia are still limited. Among those that do exist, the focus was on either general motivation factors for participation or e-participation that uses the internet as a channel for public participation. There are almost no studies that adapted the technology acceptance models and theories to the domain of TMSP systems using mobile technology.

To fill these knowledge gaps and build a culturally-relevant TMSP system acceptance model, this dissertation aims to answer the following research questions. The high level framing research question is

- ***Why are people motivated (or not motivated) to take participatory actions to be more involved and engaged within their communities?***

This general research question has two sub-questions of interest:

- **RQ1:** What are the key factors that influence the acceptance and use of technology-mediated social participation [TMSP] systems?

- **RQ2:** How are different motivational factors related to the intention to use the TMSP systems?

Chapter 3: Research Methodology

This chapter begins by providing a description of the research approach and its underpinning rationale. It also will describe the sampling strategy and the techniques used in data collection. The analysis and validation of the data collected also will be discussed. This research is conducted by adopting a mixed-methods approach; thus, the chapter ends with a discussion of meta-inference and overall data quality.

3.1 Research Approach

This research used a combination of qualitative and quantitative methods to modify, and then validate a TMSP system acceptance model. Focus groups and interviews were used to explore, adapt, and discover constructs to extend a UTAUT-based model to the TMSP (incident reporting) domain. A large-scale survey was then used to validate proposed model. The full research plan, including data collection phases, research questions, research methods, and expected outcomes, is outlined in Table 3.1 below

Goal	Research Question	Research Method	Output
Phase 1: Qualitative • Identify motivational factors to use TMSP systems in the public good domain. • Develop a TMSP systems adoption model.	Research Question: What are the key factors that influence the acceptance and use of TMSP systems?	Literature Review + Focus Groups + Individual Interviews	• A set of key motivational factors from literature. • Contextual facilitators and barriers of accepting and using TMSP systems. • An initial model of acceptance
Phase 2: Quantitative • Empirically test the model developed in Phase 1. • Examine relationships between identified factors and usage intention of TMSP systems.	Research Question: How are different motivational factors associated with the intention of using the TMSP systems?	Large Scale Web-based Survey	• A set of relationships between motivational factors and Usage intention of TMSP systems • A validated model of TMSP systems adoption in the domain of public good.

3-1 Research plan

3.1.1   Mixed Methods Approach

Mixed-methods research combines the collection and analysis of both qualitative and quantitative data at some stage of the research process within a single study. Many definitions of mixed-methods are available in the literature; this approach focuses on research questions that call for real-life contextual understanding and cultural influences (Johnson, Onwuegbuzie & Turner, 2007).

In any study, one of the challenges is the employment of the right and most appropriate methodologies to assist the researcher in collecting the best data possible so as to investigate the research questions at hand; therefore, selecting the methodological approach is not an arbitrary decision, and has to be both rationalized and justified. The fundamental rationale behind using the mixed-methods approach was the ability to learn more about the research topic through combining the strengths of qualitative research with the strengths of quantitative research, whilst at once compensating for the weaknesses associated with each method (Johnson & Onwuegbuzie, 2004). This approach allows the researcher to develop insight into the phenomenon of interest, which otherwise would be difficult to fully understand using a single method. The design trade off in all of these boils down to the order, sequential or concurrent, of the different methods.

Although using a single research method is recognized as suitable and efficient in answering research inquiries; there is evidence that a mixed-methods approach is more advantageous. Venkatesh, Brown & Balla (2013) have discussed three strengths of applying a mixed-methods approach in Information Systems research: first, by using this approach, the researcher can address exploratory and confirmatory research questions simultaneously; second, mixed methods have the

ability to provide stronger inference and results than a single method; and third, conducting mixed methods offers an assorted divergence of view that adds strength to the study's overall end results.

Despite the fact that the mixed-methods approach is a valuable when conducting an inquiry, it is not appropriate for all types of research. Venkatesh et al. (2013) summarised the Information Systems literature to derive seven purposes for completing a mixed methods study, as shown in Table 3.2.

Purpose of Mixed Methods Research	
Purpose	**Description**
Complementary	Mixed methods are used in order to gain complementary views about the same phenomena or relationships.
Completeness	Mixed methods designs are used to make sure a complete picture of a phenomenon is obtained.
Developmental*	Questions for one strand emerge from the inferences of a previous one (sequential mixed methods), or one strand provides hypotheses to be tested in the next one.
Expansion	Mixed methods are used in order to explain or expand upon the understanding obtained in a previous strand of a study.
Conformation	Mixed methods are used in order to assess the credibility of inferences obtained from one approach (strand).
Compensation	Mixed methods enable compensating for the weaknesses of one approach by using the other.
Diversity	Mixed methods are used with the hope of obtaining divergent views of the same phenomenon.

3-2 Purpose Of Mixed Methods Research Adapted From (Venkatesh Et Al., 2013)

It is crucial to determine the appropriateness of a mixed-methods approach in this study. Venkatesh et al. (2013) provided guidelines for conducting and evaluating any mixed-methods research; they focused on three areas, namely the appropriateness of mixed methods research, meta-inferences, and validation. Moreover, several researchers have concluded that the selection of a mixed-methods approach should be driven by the context of the researcher's questions and the objectives of such questions(Mingers, 2001; Teddlie & Tashakkori, 2009).

3.1.2   Rationale and appropriateness of Mixed Methods

There is no single research method that is better than any other; meaning, there is no right or wrong method. Nonetheless, each method accomplishes different purposes(Silverman & Marvasti, 2008). The choice of research method depends on research questions, research goals, and the values and beliefs of researchers, which align with the concept of appropriateness. In assessing the suitability of this approach in line with the dissertation's study, it was important to examine the purpose of using this approach. First, the purpose of using mixed methods in my study is developmental. In the developmental design, questions for one strand emerge from the inferences of a previous one (sequential mixed methods), or one strand provides hypotheses to be tested in the following strand. My research design follows the sequential mixed-methods proposed by Creswell (2003), where a qualitative study will be used to develop the adoption model's constructs and hypotheses, with a quantitative study conducted after in order to empirically validate the model and test the hypotheses. The sequence, priority and integration of the research's qualitative and quantitative phases are illustrated in Figure 3.1. In Creswell's original model design, emphasis was placed on the initial qualitative data collection phase; however, in my dissertation's study, priority is afforded to the quantitative phase, with the

qualitative phase used to assist in developing the adoption model constructs and forming the hypotheses.
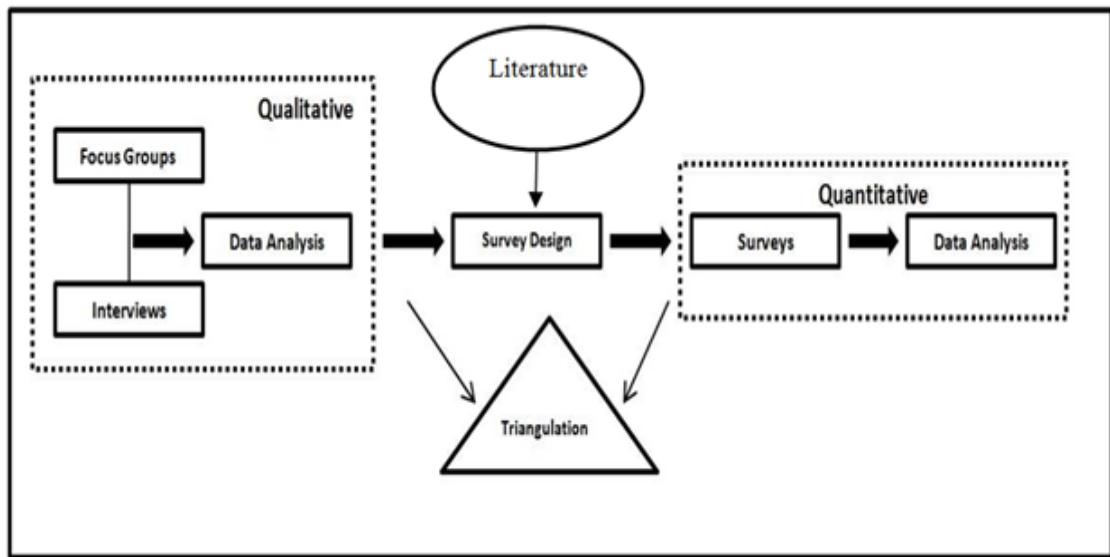
Figure 3.1 Sequential Mixed Methods Design By Creswell (2003)

Second, I firmly believe that single methods complement one another when they are combined in a single study. The depth achievable by qualitative techniques and the generalizability of quantitative techniques can inform each other, resulting in more comprehensive and balanced view of complex issues (Creswell, 2003). Third, the acceptance of technology requires both understanding of the rich social context that can be gained through qualitative techniques and testing the relationship between acceptance factors through quantitative techniques. Based on the three reasons discussed, I argue that the use of a mixed-methods approach in this study is the most appropriate one in relation to the kind of research questions being investigated.

3.1.3 Mixed Methods Approach & Technology Acceptance Research

The technology acceptance literature shows a dominant single method quantitative approach when answering research questions. It is not a surprising fact to recognize that the TAM model itself was a product of a quantitative survey-based

study. Leeet al. (2003) surveyed the literature on the TAM model, and accordingly found all 101 articles included, except three, used a survey-based quantitative approach. There is a general dearth of research in Information Systems that employs a mixed-methods approach (Venkatesh et al., 2013), and particularly in the field of technology acceptance studies (Wu, 2012).

Wu (2012) reports various limitations in relying on quantitative methods only when studying technology acceptance and the behavioral intention of use. One problem is that all data gathered from questionnaires and surveys is self-reported, thus meaning it is prone to some well-known biases. Accordingly, some technology acceptance studies have found that the self-reporting of Usage Intention may not lead to actual use behavior. Moreover, quantitative data analysis reduces complex and contextual human-technology relations, which are important for developing a holistic understanding of the acceptance and adoption process (Wu, 2012).

A mixed-methods approach to the technology acceptance research is advantageous, and it has the potential to move beyond the conceptualisation and Usage intention. Combining a quantitative approach with a qualitative approach can lead to better understanding of the contextual acceptance and the overall use of technology that cannot be gained by using a single quantitative method.

In the previous section, the research design, the mixed-methods approach and the application of this approach are presented in direct relation to the technology acceptance domain. In the next section, the case study approach and rational behind its use will be discussed.

3.1.4 Case Study Research

There are several definitions of the term 'case study'; however, one dominant definition in the literature is that a case study examines a phenomenon in its natural context and uses several methods of data collection to gather facts from different units (Benbasat, Goldstein& Mead, 1987; Yin, 2003). Another definition, as given by Merriam (2008), centres on a case study as being an exploration of a 'bounded system'over time, through detailed, in-depth data collection involving multiple sources of information, which also is rich in context.

In this research, I intended to explore the factors influencing the acceptance of TMSP systems in the Kingdom of Saudi Arabia. For this kind of research, an empirical case study has been conducted in an effort to explore the problem of the acceptance and adoption in daily life. The problem under study in this dissertation was complex since it dealt with people, and their behaviors and intentions to use a piece of technology. Thus, a case study was more likely to achieve understanding of this complex phenomenon(Yin, 2003).

In any case study, it is important to decide on the unit of analysis that is considered most suitable and accessible to the purposes of the research. It is equally important to determine whether the focus will be on individuals, groups or entities as a whole (Benbasat et al., 1987). Therefore, for the purpose of this research, the focus of the study was on the citizens (individuals) of the KSA. Through examining why citizens accept or do not accept TMSP systems, and how to ensure their sustainable participation in their community through using mobile TMSP systems.

According to Yin (2009), the use of a single case study is beneficial, and is considered appropriate when the case is revelatory, or when it represents a critical matter for testing a theory, or it is an extreme or unique case (Yin, 2003).I chose to complete a monoculture, single-case approach for the uniqueness of the study site (Kingdom of Saudi Arabia). A brief description of the study site and the rationale behind its selection has been discussed in the previous chapter (see chapter 2).

Finally, the ultimate goal of adapting a case study method was to set the research scope and borders. Wu (2012) directed my attention to a common misunderstanding of the case study concept. Specifically in the IS literature, it is not uncommon for a case study to be viewed as a synonym of a qualitative study; however, unlike other research approaches, the case study does not utilise any particular methods of data collection or data analysis (Merriam, 2009).

3.2 **Research Design**

When designing a mixed-methods study, three issues should be considered: priority, implementation, and integration(Creswell & Plano Clark, 2007). Priority refers to which of the qualitative and quantitative methods receive greater emphasis in the general study design. Implementation refers to whether the qualitative and quantitative data-collection and analysis comes in sequence or happens concurrently. Integration concerns the stage of research when qualitative and quantitative data is integrated or merged. As mentioned in the previous sections, this study has followed a well-known design approach (two-phase, mixed-methods, case study approach). The design is adapted from the 'sequential exploratory design' described by Creswell (2003) (see Figure 3.1).

In the first phase, qualitative methods were used as an exploratory belief elicitation technique to unearth the motivational factors of TMSP systems' acceptance amongst citizens of the KSA. I have initiated this phase by conducting a pilot study in the USA with the goal of of collecting initial qualitative data and to ensure I asked the right questions. This phase explored motivational factors through conducting individual and group interviews about public's perceptions, attitudes, and opinions regarding TMSP systems that were designed for 'incident reporting'. This was to identify motivational factors, and even potential barriers that may affect acceptance. The factors identified confirmed some of the known motivational factors recognized as existing in the literature. Moreover, new items derived from coding the qualitative data,were added for testing in the context of the KSA.

The second phase of this study explored the relationships between the factors and the public's intention to use TMSP systems through the use of a web-based

survey aimed at gathering data about their motivations for the use (or non-use) in addition to their perceptions of engagement for the public good and their demographic information. This survey instrument was designed based on the results acquired from the first phase.

The priority in this study design was afforded to the second quantitative phase. The aim of the whole study was to identify the factors impacting citizens' acceptance and adoption of TMSP systems. It also aimed at building a generic and culturally appropriate model for TMSP systems in the domain of public good. The validation of this model was a result of the second phase, which gave it a higher priority than the first phase. Through adopting a sequential implementation phase (phase one ➜ phase two), each phase has produced unique results. However, the analysis of these two phases was integrated (Meta-Inference) at the stage of results interpretation and discussion (see chapter 6).

3.3   Phase One: Constructs Generation

Qualitative research is an approach used in order to understand and explore the meaning of individuals or groups, and to describe human and social matters (Creswell, 2003). Given the complex nature of the topic being explored, this phase of the study sought to answer the research question:

What are the key factors influencing the acceptance and use of TMSP systems?

3.3.1   Participants and Sampling Scheme

The enquiry at hand targeted the citizens of the Kingdom of Saudi Arabia, which is a unique and particular population. The researcher should plan to reduce the risk of obtaining invalid or irrelevant data by targeting specific participants who would provide him with valuable contributions to the topic, especially throughout the exploratory stage (Coyne IT, 1997).

Two sampling schemes were used in this study. I began with the convenience sampling procedure, which involved easily accessible and willing participants (the recruitment plan is detailed in section 3.3.3). Following the first round of data collection, the sampling was changed to a purposeful approach. Purposeful sampling takes place when the researcher selects a sample from which the most can be learned, and it is the most common sampling strategy in qualitative research (Merriam, 2009). More specifically, snowballing (which is a subset of purposeful sampling) was used to ensure a sample that could help to answer the research inquiry and enrich its findings. This was carried out by involving the first participant group in the recruiting process. They were asked to refer and recruit some of their acquaintances who might be

willing to participate in the study. Despite the start with accessible subjects, there was the general criterion set to recruit potential participants. The criteria were:

1- Participants need to be at least 18years old.

2- Participants must be Saudi citizens.

3- Participants should be Smart Phone users.

4- Participants should be willing to download mobile apps that serve the purpose of the study.

3.3.2   Data Sources

This phase involved two qualitative data collection activities: focus group interviewing and in-depth semi-structured individual interviews. Conducting interviews is probably the most common type of data collection in qualitative studies. In some studies, it is the only source of data. Moreover, interviewing is necessary when we cannot observe behavior, feelings, or how people interpret the world around them (Merriam, 2009).

3.3.2.1   Focus Group Interviews

Focus groups can be used at the preliminary or exploratory stages of a study(Krueger & Casey, 2000). Therefore, the first phase was started by conducting focus groups. The main purpose of a focus group research is to draw upon respondents' attitudes, feelings, beliefs, experiences and reactions in a way that otherwise might not be feasible using other methods, such as observations, one-to-one interviewing or questionnaire surveys. These attitudes, feelings and beliefs could be partially independent of a group or its social setting, but are more likely to be revealed

via the social gathering and the interaction which being in a focus group entails(Morgan, 1988).The output from a focus group study may be used to supplement, amplify and accordingly illustrate constructs from the existing theories and models, which align well with the overall aim of this phase of research.

3.3.2.2   *Focus Group Interviews Strength and Limitations*

Focus groups have several strengths, one of the major ones being its exploratory nature. In addition, focus groups can assist in generating new ideas and hypotheses(Lunt & Livingstone, 1996). On the contrary, focus groups have various limitations, especially when they are conducted in a specific context, such asin the case of the present study. Issues can arise when researchers are not fluent in the language or are aware of the culture of the groups with under study. Moreover, the perceived identity and self-presentation of the researcher or facilitator could inhibit the access and recruitment of participants (Culley, Hudson& Rapport, 2007).However, in the present study, these are not of concern as I (the researcher) share the same language, culture and values of the study participants. It should be noted, however, that the focus group methodology is qualitative and exploratory in nature, and therefore is not intended to provide data that are generalizable to a stated universe.

3.3.2.2.1   Focus Group Purpose

In this dissertation, the purpose of using focus group interviews in the early stage of research was to provide initial insight into the known and emerging factors, both societal and technical, affecting the acceptance and adoption of TMSP systems used for public good in the Kingdom of Saudi Arabia. More specifically, I intended to garner better understanding into the factors influencing public engagement in their

communities. Moreover, the aim of these focus groups was to obtain more in-depth information so as to understand and accordingly develop new contextual factors; this would allow survey instrument to be tested that was developed in the second phase of the research.

3.3.2.2.2 Focus Group Objectives

The use of focus groups in this study comprised six objectives, as follows:

1- To gain insight into the motivation factors influencing public participation.

2- To gain insight into the motivation factors influencing the adoption of TMSP systems.

3- To gain insight into the barriers discouraging public participation

4- To gain insight into the barriers discouraging the adoption of TMSP systems.

5- To use the insight from this study in constructing the culturally appropriate adoption model of TMSP systems.

6- To use the insight from this study in the design and development of the survey instrument.

As illustrated in Figure 3.2, the focus groups output has informed the development of the quantitative component's instrument of this research. According to Morgan, focus groups have been recommended as a means to construct surveys or questionnaires. Essentially, there are three things that focus groups can contribute to the survey:

1. Capturing all the domains needed to be included in the survey.

2. Determining the dimensions that make up the domains.

3. Assisting in items and survey question wording.

Figure 3.2 Survey Instrument Design

The focus group questions were built from the technology acceptance literature and the researcher's own informed assumptions. Following the application of a funnel approach, the focus group started with broader questions and then gradually moved to narrower questions. This approach was adapted in order to break the ice and to attract as much attention and information from participants as possible. When preparing the questions, I took into account asking diverse kinds of questions, and I used reflection, examples. Based on the initial analysis of first focus group, the question set had been slightly modified.

The questions were as follow (see Appendix A for the Arabic version of the Focus Group Questions):

1. *Let's do a quick round of introductions. Can each of you tell the group your name, and whether or not you have used a participation tool in Saudi Arabia?*

2. *Tell me about positive or disappointing experiences you have had with reporting tools in Saudi Arabia?*

3. *Who or what has influenced your participation?*

4. *Let's list all the reasons preventing Saudi citizens from using participation tools.*

5. *Now, how about ranking or voting on these reasons as to whether or not you are behind participation?*

6. *Suppose that you were in charge and could make one change that would make people accept and use these tools. What would you do?*

7. *Would you encourage others to use these tools? What are the reasons behind your views?*

8. *What do the participation tools lack? If you had the opportunity to design one, what would you add or take out?*

9. *Take a piece of paper and jot down three things that are important to you in participating.*

10. *Is there anything else you'd like to tell me about in regards community participation tools that we have not discussed?*

Due to the fact that all participants and the researcher's native language is Arabic, the focus group questions were in Arabic and have been reviewed by a different

native Arabic speaker in order to validate them. This was done so as to ensure content clarity and the suitability of the questions in line with the overall goal of the research.

3.3.2.3 Individual Interviews

After collecting enough data from the focus groups where I started not to encounter any new information, the theoretical model of TMSP acceptance was generated. Following the initial version of this model, another round of qualitative data collection started in the form of individual interviews. The goal of conducting individual interviews was to cover any aspects or factors not caught during the first round of qualitative data collection.

| Focus Groups Results | → | Initial TMSP Adoption Model | → | Individual Interviews Results | → | Final TMSP AdoptionModel |
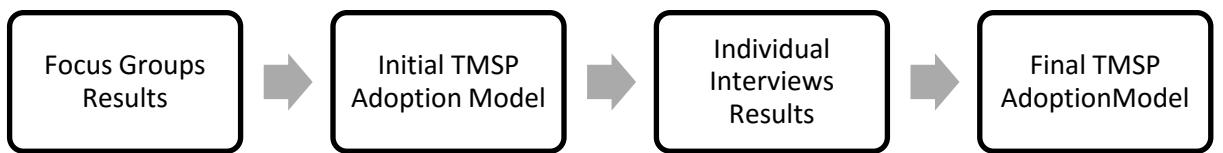
Figure 3.3: TMSP Acceptance Model Development Stages

3.3.2.3.1 Individual Interviews Types

Interviews can be conducted in several forms. The most widely practiced form is face-to-face interviews, where the researcher interviews all of the participants individually. Besides the known benefits of this form, sitting with the interviewees will help the researcher see and observe body language, and take into account the tones of the responses. Initially, it was planned that this form for data collection would be used; however, due to the fact that I am targeting Saudi participants whilst living in the USA, I had to conduct those interviews using video conference software (Skype), which allowed for live sessions with the participants. Out of the three types

of interview (standardized, semi-structured, and informal), I adapted the semi-structured type, and I prepared my interview guide based on this selection.

Standardized interviews are not a good choice when talking to people and asking them to express their opinion. As Merriam (2012) mentioned in her book, standardized interviews are nothing but an oral form of a survey, and so I decided against using this type. I built my interview protocol with a mix of structured and less structured questions. I ensured that all of the questions were used in a flexible manner. However, not like all typical semi-structured interview guides, I preferred to have a predetermined order for my questions because I thought it would keep the interview under my control, and I could jump up and down in the list of questions based on the interview flow. I used this set of pre-planned core questions for guidance, such that the same areas are covered with each interviewee. As the interview progresses, the interviewees were given opportunity to elaborate or provide more relevant information, as and when needed. This decision allowed me to respond to the situation at hand, to the emerging worldview of the interviewees, and to ideas that came up on the topic.

3.3.2.3.2 Individual Interviews Protocol

I believe that the key to garnering good data from interviews involves asking good questions; therefore, my interview guide went through several iterations. I added, deleted and re-ordered questions after the first couple of interviews. The interview guide included three major sets of questions: 1) general questions about the participants' background;2) questions about the acceptance of various participation and engagement systems; and 3) specific questions relating to the motivation and barriers of participation systems existent in Saudi Arabia. The questions were mainly based on the themes grounded in the literature, theoretical foundations, and models of technology acceptance. The analysis also adopted an analytic induction approach so as to uncover new themes emerging from the data that have not been previously developed in the literature.

As with the focus groups, the Balagh Tejary application was used to introduce the participant to the concept of TMSP systems. The interview guide the followed built directly on these concepts (see Appendix for the Arabic version of the Interview Protocol):

1. What kind of practices would you consider as cheating or commercial violation? Can you give me some examples of violations?

2. Please tell me about any violations that you have experienced on shops, restaurant or anywhere else.

> [Probe] How did you/ or others with you / react to this violation?
> [If the interviewee indicates that s/he has not experienced any violation]:
> Have you heard about other friends or relatives' experiences with fraud or violations by shops?

3. Are these violations unique to shops in Saudi Arabia? Or you can find them elsewhere?

4. Do you believe that shops' violations are increasing or decreasing?

5. What are the reasons behind the existence/increasing/decreasing of shops' violations?

6. If you experience a violation by a restaurant or shop, what would you do? And what do you think citizens should do?

[Probe 1] What is the best way to stop violations?

[Probe 2] What would be the best way to inform the responsible government agency about such violations?

[Prop 3] After you have experienced about a violation, what did you do to ensure it never happens again to you or to your fellow citizen?

7. Please tell me what you know about Balagh Tejary (Ministry of Commerce mobile App).

[If the interviewee has never heard of Balagh Tejary before, give this brief introduction: 'It is a mobile phone application developed by the Ministry of Commerce where people take a picture, send a notice and report a violation by shops or restaurants. Would you like to have a look?']

8. If the interviewee did not know about Balagh Tejary prior to this interview]

Based on what you just learned about Balagh Tejary, would you download it? Use it?

[Prop 1] If the answer is 'Yes' – So, what makes you want to download it and use it?

(Probe about perception of risk, perception of benefit of action, perception of effort and cost, authoritarian influence, peer influence, and technical factors.)

[Prop 2] If the answer is 'No' – Why you don't want to sign up? (Probe about perception of risk, perception of benefit of action, perception of effort and cost, authoritarian influence, peer influence, and technical factors.)

9) [If the interviewee knew about Balagh Tejary prior to this interview but did notUse it]

    Can you tell me why you haven't signed up for the service? (Probe about perception of risk, perception of benefit of action, perception of effort and cost, authoritarian influence, peer influence, and technical factors.)

10) [If the interviewee indicated that s/he has already used it]

    a) Why did you download it? (Probe about perception of risk, perception of benefit of action, perception of effort and cost, authoritarian influence, peer influence and technical factors.)

    b) Was it easy to use? Describe your experience?

    c) Did you recommend anyone else to try it?

    d) Do you think this app is useful? Did someone contact you regarding the violation or report?

    e) What will make you stop reporting the violations?

    f) Will you report the violation if you are a regular customer of this shop?

11. What are your experiences so far?

12. Do you want to see more of these applications?

13. What particular services or agencies should have one?

14. Do you think there are obstacles to successfully implementing community participation applications in Saudi Arabia?

15. Is there anything else that you'd like to tell me about Balagh Tejary and community participation tools in general?

3.3.3 Focus Group Recruitment, Setting, and Execution

Following the approval of the research protocol by the Institutional Review Board (IRB) at UMBC (protocol# Y14WL12073) (see Appendix), I began to arrange the recruitment and execution of the data collection procedure. Initially, four focus groups were organized; three of them were held at the study's main site the Kingdom of Saudi Arabia; however, the first one was held in Baltimore Maryland, with Saudi participants who were international students in the USA attending an English language course. As the research progressed—and also due to the imbalance in gender distribution in the first four focus groups—there was a need to conduct more focus groups with female participants only.

Heterogeneous and homogeneous focus groups offer both advantages and disadvantages. In homogenous focus groups, it may be easier to create an atmosphere where everyone feels comfortable and feels free to speak out, without having to defend their points of view against others. This was very important as mixing gender is a taboo issue in the culture under examination. Generally, females in Saudi Arabia grow up in a very segregated environment, and they are not encouraged to express their honest feelings or opinions around men. It is also very difficult, if not impossible, to recruit female participants when the researcher conducting the study is a male, especially if the focus group is conducted in Saudi Arabia. The country laws and regulations do not allow unrelated men and women to meet, socialize or even study in the same place. One of the solutions to this issue was to have a female family member of the researcher facilitate the female-only focus group; however, lack of time and interest by well-educated female family members, besides the lack of domain knowledge, caused me to consider other solutions. Alternatively, I thought

about organizing a focus group with my own female relatives; this was the most convenient option, but this would cause an unwanted amount of bias and ultimately would violate the sampling strategy of the study. The third option was to conduct the whole focus group session online using video-conferencing applications and tools. This option was not viable knowing to the difficulty surrounding the session scheduling. Moreover, this option was not favoured by the first few female participants I tried to recruit, as their families did not think talking to a random male over the internet was a good idea. After considering these circumstances, the decision was made to conduct mono-gender female focus groups in the United States with Saudi females who are in the US to pursue their education.

Saudi females studying abroad usually are open-minded and are used to being in a mixed-gender environment. So as to avoid the bias caused by this factor, I recruited only those participants who have been in the US for less than a year. This was in an effort to minimize the cultural differences to which they may have become accustomed through living abroad. A full recruiting procedure is detailed in following sections.

These first focus group participants were recruited from the English Language Canter at UMBC, whereas the remaining mixed-gender focus groups were recruited through personal contacts and referrals. On the other hand, for the two female-only focus groups, I sought help from a current female PhD student on the same programme. She voluntarily assisted me in recruiting and connecting me with female participants.

Each focus group had 4–6 participants, with each group lasting between 60 and 100 minutes. The recommended number of focus group participants varies; it can

be as few as 4 (Kitzinger, 1995); some researchers, on the other hand, recommend 6–
10 participants (MacIntosh, 1993) (see Table 3.3).

Focus Group	Date	Participants Number	Age	Location
1	December /5 / 2013	6	19-32	Maryland- USA
2	January / 9/ 2014	4	22-26	Alahsaa- KSA
3	January / 10/ 2014	6	21-28	Alahsaa-KSA
4	January/18 / 2014	5	20-41	Riyadh- KSA
5*	February/5/2015	4	19-33	Maryland USA
6*	April/6/2015	5	23-34	Maryland- USA

*FEMALE-ONLY SESSION

3-3 FOCUS GROUOPS INFORMATION

3.3.3.1 *Study Setting*

Focus groups 1, 5 and 6 were conducted in a lab-conference room in the ITE
building at UMBC. The second and third focus groups were carried out in conference
rooms at King Faisal University in Riyadh, whilst the fourth focus group was carried
out in a café offering a conference space that could be booked for a reasonable rate
per hour. In all of these places, I aimed at selecting venues with minimal distractions
and that were convenient to the participants. All rooms were furnished with
comfortable chairs, white boards, and a table at the centre, which allowed me to
observe and interact with all participants. Participants were provided with
refreshments. One of the sessions' participants was provided with pizza as the focus
group was overlapping their lunch time.

FIGURE 3.4 FOCUS GROUP SETTING

3.3.3.2 Focus Groups Execution

All focus groups were begun by introducing the topic and breaking the ice by offering some refreshments and snacks. All focus groups were audio-recorded, and I asked the participants for their permission to take photographs. All focus groups were conducted in Arabic, and the tapes were transcribed. The transcription then were coded and analysed so as to identify concepts, relationships, and patterns present within and across multiple focus groups conducted during the study; on the whole, motivation factors and facilitators were used to accept and adapt TMSP systems .The focus groups were organized in the following way:

1. *Introductory round:* At the beginning of the focus group, I presented myself (the researcher) and welcomed the participants. I then gave a brief description of the focus group. More specifically, I explained to them that the focus group was about the motivation factors and barriers facing TMSP system acceptance and adoption. Following this, and prior to the commencement of each focus group, I

distributed the consent form and had the participants sign it. I also made it clear that they would be able to withdraw from the study at any time. All participants were assured that they would remain anonymous throughout the research and in any publications arising from the study. This round concluded when the participants introduced themselves and after participants confirmed they understood the purpose of the focus group.

2. *Group Discussion:* The group discussion was the most crucial and engaging part of the focus group. During this time, participants freely discussed their opinions with one another, and collectively answered the guiding questions from the researcher. The discussion was clustered around the core set of questions concerning the motivations and barriers of the acceptance of TMSP systems. Although the focus group questions were prepared and fixed, it was during this phase that probes, clarification, and further insights were introduced to the participants. It is worth mentioning that, due to the novelty and short age of these systems in Saudi Arabia, the participants were presented with a scenario and screenshots for one of the existing mobile reporting applications. This research choice had some implications on the study findings, and I discovered these implications whilst developing the phase two instrument. The model construction also was affected by the idea that participants gained about this class of TMSP systems through the presented scenario. A full discussion of these implications will be explained in the Discussion chapter of this dissertation (see Chapter 6).

3.*Individual Tasks:* Although the focus group technique's nature limited the individual task or conversation, I thought it was important to hear from every participant in the group. Therefore, I asked each participant to reflect on what they consider to be the factors facing their acceptance and adoption of TMSP systems, which are designed for use in the public domain. I also handed the participants a piece of paper, and asked them to jot down some important factors or system design criteria they considered essential in their use of such technologies.

3.3.4   Interview Recruitment, Setting, and Execution

When the first round of the qualitative data collection ended, the focus groups findings were a good base to start constructing the TMSP adoption model. The focus groups' outcome was a list of motivational factors for use in TMSP systems. This list was confirmed and refined by conducting semi-structured individual interviews. The goal of conducting individual interviews was centred on covering any aspects or factors not captured during the first round of the qualitative data collection. The individual interviews allowed garnering in-depth, detailed and generally better understanding as to why people use or choose not to use the incident reporting mobile applications available in Saudi Arabia at the time of the interviews.

Recruitment for the individual interviews was much easier than recruiting for focus groups. This is obviously expected when seeking to recruit and schedule an individual rather than a group. I did not set a predetermined number of participants, and I kept interviewing until I reached theoretical saturation. I stopped when I began to hear the same factors over and over again. By the end of this data collection activity, I interviewed seven individuals on top of the six finished focus groups. All

individual interviews participants had not participated in the first round of data collection the focus groups. (see table 3.4).

Interview	Date	Gender	Age	Interview mean
1	April /29 / 2015	Male	37	Video-Conference
2	May / 8/ 2015	Male	25	Video-Conference
3	May / 11/ 2015	Male	19	Video-Conference
4	May / 27/ 2015	Female	Declined to disclose	Phone
5	June/5/2015	Female	22	Audi-Conference
6	June/5/2015	Male	54	In-Person
7	June/12/2015	Male	29	In-Person

3-4 Interview summary

Gender might not be an issue when recruiting for studies in Western countries; however, based on my own experience, I found that recruiting male participants was much easier than recruiting females. This is to be expected in studies conducted in the Saudi context. The difficulty stemmed from the difference in gender between the researcher and the participants: Saudi females do not usually feel comfortable when interacting with Saudi male strangers. In fact, one of the few female participants informed that one of her female friends expressed an interest in participating, but this interest had faded when her male brother asked her not to contact me.

The majority of the interviews were completed over the internet due to the fact I was interviewing participants who resided in Saudi Arabia whilst I am residing in the US. Four out of the seven interviews were conducted over Skype. Three of them adopted a video-conference mode, whereas one was audio only, as the female participant did not want to turn on her web-cam. One of the seven interviews with the second female participant was carried out over landline because she was not interested in sharing her SkypeID or cell phone number with me. The reaming two interviews were carried out in person during my summer visit to Saudi Arabia. These last two

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were conducted in a café located in the capital city of Saudi Arabia; Riyadh. The participants were picked based on the criteria explained in the sampling strategy section. The interviewees signed a consent form or verbally agreed to consent over the telephone. Each interview lasted between 35 and 50 minutes, and they followed the same funnel approach described in the focus group execution. In this study, the interviews, both individual and focus group, were recorded and transcribed.

3.3.5   Data Analysis

Qualitative research results in large amounts of contextually detailed data. The analysis of data collected is a major challenge (Merriam, 2009).Merriam defines the data analysis as 'a process used to answer your research questions'. Others look at analysis as the process of making sense of the data captured through classification, with interpretation and finally synthesis carried out after.

The data analysis process is intensely iterative, and completing this in the early stages in conjunction with data collection is an important factor to end up with well-defined themes. Most researchers use data analysis and coding interchangeably in order to refer to the process of systematically discovering and identifying concepts, relations and patterns in non-numerical data.

In my study, I was mainly interested in the content analysis to identify motivational factors of TMSP systems acceptance. Out of the three content analysis approaches (Inductive, Deductive, and Summative), the data analysis began with the deductive (directed) approach so as to confirm factors and constructs existing in the literature. Thereafter, an inductive approach was adapted to identify the new constructs that emerged from the data in order to extend the model. A thematic analysis is what researchers refer to when they describe an analysis procedure that

allows for both deductive and inductive approaches (Fereday & Muir-Cochrane, 2006).

The data progressed through several stages in the analysis process. First, I prepared the data by transforming the recorded tapes into written scripts. Subsequently, I started the process by reading the first interview transcript. I made notations next to any data that interested me as potentially related to answering my research question. In order to lose less in translation, coding was carried out in native Arabic. For the purpose of presenting the research findings, the themes were translated into English. At that stage, I tried to be as expansive as possible, and I aimed at identifying any words or segments that might be useful. I used the open-coding technique, where I counted and outlined the occurrences and frequencies of particular terms, fragments, or words, so as to reduce the size of useful data. Following the first round of reading, I re-read once again and repeated the same process with the remaining interviews transcripts, and compared them (comparative analysis).

After several iteration and cycles of open-coding, I moved to the phase where the axial coding was used. The purpose underpinning this approach of coding was seeking to establish relationships between the initial patterns identified in my open-coding. By using axial coding, I was able to notice and create relationships amongst the factors emerging during earlier stages of coding.

The approach I adopted was one of analytic induction. Initially, this was deductive, seeking to match the coded categories to constructs in the existing technology acceptance models; however, there was an inductive component, during which I looked for categories that do not fit any existing models and which generated

new constructs best representing those codes and themes. The result of this analysis was used to develop the constructs of the TMSP adoption model in the following chapter.

Overall the same framework was used to analyze the individual interviews transcripts. However, the individual interviews analysis was mainly deductive as the these happened after the themes were extracted from the focus group data. Moreover, the initial TMSP systems acceptance model was already constructed before the individual interviews started. Thus, they pre-identified codes from focus groups were used during the analysis of the individual interviews. I aimed to link the interviews data to the 11 constructs of my model and to the 60 codes identified in the focus groups.

3.3.6   Trustworthiness of the qualitative data

It is important to note that qualitative research has different accepted validation guidelines than quantitative methods (Lee & Hubona, 2009). Trustworthiness is the correspondence term used in qualitative method as a measure of the research quality; in this study; I sought to meet the trustworthiness standards. In order to enhance the overall quality of this research, I employed these techniques. *Representativeness* is centred on the people chosen to be interviewed (Seaman, 1999). In this study, I ensured participants in the group and individual interviews were diverse and representative of the population. *Member-checking* (which is critical to establish *credibility*) also was employed by garnering feedback from the participants as to the accuracy of the factors and themes identified so as to enhance validity. I compared the

feedback I received from focus groups participants with those from individual interviews. I also used multiple data-collection techniques (following group interviews with individual interviews) to ensure method *triangulation*. Moreover, the prolonged *engagement* with the data serves as a good measure of the research quality. Although each focus group or individual interview lasted for an hour on average, these sessions were spread across the year; this gave me the opportunity to check on any inaccurate information and to further verify the qualitative data collected. In addition, as detailed in the earlier section, a rich and thick description of the study setting, and procedure execution, is provided to enhance *transferability*.

Finally, the inter-coder reliability technique was used to enhance reliability. A sub-setof the data (15%) was given to an external coder. The goal was to measure the agreement in coding and to check whether a different coder perceived a piece of content in the same way as the researcher, and to code it accordingly. The inter-coder reliability was measured in percent agreement. An agreement of 78% was achieved, with disagreements discussed until consensus was achieved.

3.4   Phase Two: Model Validation

The quantitative approach refers to the systematic empirical investigation of a phenomenon via statistical, mathematical or numerical data, or computational techniques(Given, 2008). The main goal of this research phase was concerned with testing the proposed model and answering the following question:

How are different motivational factors associated with the intention of using the TMSP systems?

3.4.1   Quantitative Method Design

The output of the first phase served as an input for the second one. When this research phase was initiated, the TMSP systems' motivational factors were identified, and the TMSP systems' acceptance model was constructed following the analysis of the first phase's data. In addition, qualitative findings helped in designing the content of the survey instrument, which was used in the quantitative part of the study. Surveys are the most dominant technique of collecting quantitative data for Information Systems research (Brannen, 2009). In the domain of technology acceptance research, it is a common practise to use survey questionnaires comprising multiple scales to measure attitude and intention of technology use (Colvin & Goh, 2005).

In this research, I used a self-administrated web-based survey to collect the quantitative data. Online surveys have more advantages than the classic paper-based surveys. The simplistic administering to a random sample required little to no experimenter-subject interaction, and enabled large numbers of subjects to be accessed simultaneously at relatively low cost. Moreover, there will be no pressure on participants (respondents) to respond whilst the researcher is present. This allows

them to feel more comfortable in expressing their real opinions and attitudes. Online surveys allow researchers to conduct studies more effectively and efficiently than traditional means (Zhang, 2000). On the other hand, online surveys have various disadvantages, such as no guarantee it is the actual person filling out the survey, a lack of ability to help respondents if they have questions, and low incentives to complete if it is long (in other words, the participants more likely to stop early on and submit incomplete data). However, the advantages of the web-based survey when targeting large populations such as this one outweighed its disadvantages.

3.4.1.1   Participants and Sampling

In accordance with the same sample's inclusion criteria explained in section 3.3.2, participants were recruited randomly through the use of social media venues that targeted citizens of Saudi Arabia. Twitter, Whatsapp and Facebook were utilized to spread the survey link and to reach a diverse and representative population. One drawback of this recruiting method was the degree of sample representativeness that could be achieved: although the recruiting methods I used could fail to consider people who do not use social media, this was not an issue. Owning a Smart Phone and having the ability to download a mobile reporting application as sampling criteria indicate the need to ensure minimum technology use and knowledge.

3.4.1.2 Sample Size

The survey's study sample size determination was solely guided by the analysis approach used to validate the TMSP adoption model. In this study, I used a partial least squares (PLS-SEM) regression analysis to develop the measurement model, as well as the structured path model for path analysis. Several recent technology acceptance studies have used PLS for analysis. Venkatesh, Morris, Davis& Davis (2003)used partial least squares regression procedures to develop the measurement and structural models, whereas Davis (1989) used path analysis with the original TAM instrument(Davis, 1989) (approach detailed in section 3.4.2)

The statistical inferences derived from models constructed using Structured Equation Modelling is compromised if the sample size is too small. Figure 5 was constructed from the data published by Marcoulides & Saunders (2006), showing that the minimum sample size required for PLS-SEM (to achieve a conventional significance level of 5%, an acceptable statistical power of 80%, and a medium effect size (R^2) of at least 0.25) is a function of the maximum number of arrows pointing into a latent variable.
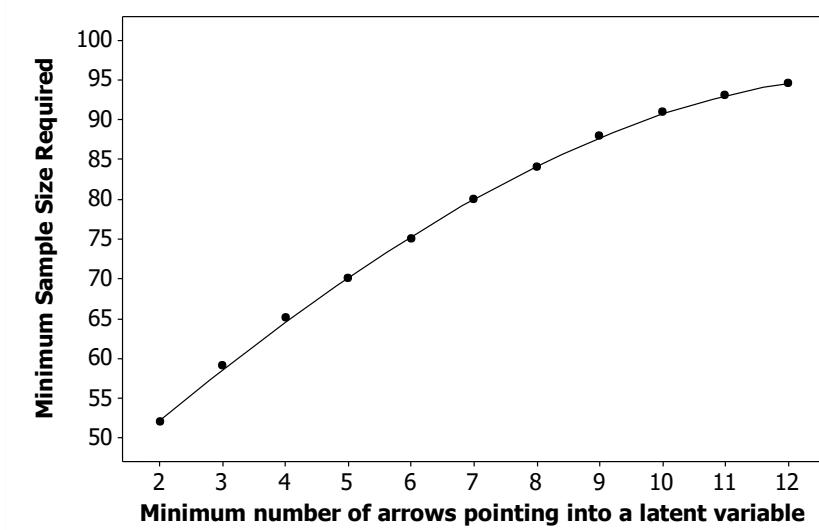
FIGURE 3.5 Sample Size

The proposed model (see chapter 4) includes 11 arrows pointing to the latent variable (Usage Intention). Consequently, the minimum sample size required for this study should be at least 93 responses.

The survey was open for participants during November and December of 2015: 35% of the responses were received in the first day of launching the survey. The response rate was better than expected, and I received 598 responses during the first few weeks. However, in order to enhance the quality of the study and to further strengthen the study findings, I used alternative methods to recruit participants. I sent the survey link to colleagues who teach in different colleges in diverse regions in Saudi Arabia, and I asked them to pass the link on to their students. Fortunately, the second round of recruiting resulted in more than 300 new responses. The total number of responses I received was 942 responses. Of these responses, 684 responses were complete and were seen to fit the inclusion criteria. The actual sample size used in this

study (684) was over 7 times the minimum requirement calculated by Marcoulides & Saunders (2006).

3.4.1.3 Survey Design and Instrument Development

Survey design is a systematic procedure consisting of two processes: Survey Content Design, and Survey Scale Design. Content design is the process of generating the questions to be answered by participants. Deciding on which questions to ask participants depends on three resources: literature, expert opinions, and individual experiences (Ozok, 2008).As discussed in Section 3.3.1.1, the survey questions will be produced mainly from the literature and from the first phase qualitative results (see Figure 3.6). All the items adapted from the literature have been modified to make them relevant to the context of TMSP systems. Table 3.5 shows the literature sources was used to construct the survey instrument. It also highlights the qualitative data contributing to the survey items wording (see Appendix 8.3for the Arabic version of the Survey questions in Arabic).
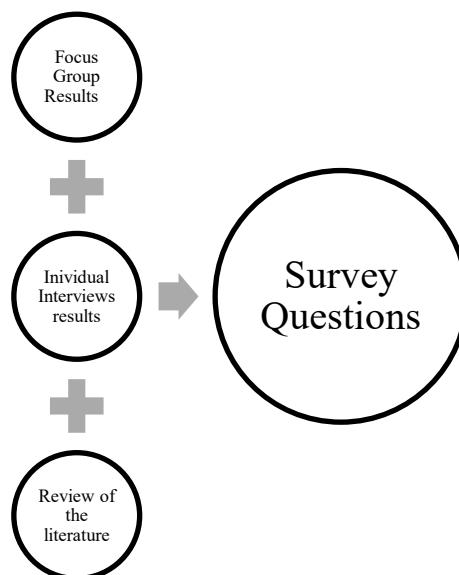
FIGURE 3.6 Source of Survey Questions

Construct	Item	Statement	Reference
Performance Expectancy	PE1	I find reporting applications useful in incident reporting.	Venkatesh et al, 2003
	PE2	Using reporting applications would enable me to report more quickly.	
	PE3	Using reporting applications would increase the effectiveness of my participation in the community.	
	PE4	Using reporting applications to report an incident will result in my issue being easily resolved.	
Effort Expectancy	EE1	My interaction with reporting applications would be clear	
	EE2	It would be easy for me to report using mobile reporting applications.	
	EE3	I find reporting applications easy to use.	
	EE4	Learning how to send a report will be easy for me.	
Social Influence	SI1	People who influence my behavior think that I should use reporting applications.	
	SI2	People who are important to me think that I should use reporting applications.	
	SI3	I will use mobile reporting applications because my friends are using them.	
Facilitating Condition	FC1	I will likely use a Smartphone to use reporting applications.	
	FC2	I will have the knowledge necessary to use the mobile reporting applications.	
	FC3	I can download reporting applications on my phone.	
Usage Intention	UI1	I intend to use reporting applications in the near future.	
	UI2	I predict I would use reporting applicationsto report in the near future.	
	UI3	I plan to use reporting applications in the near future.	
Privacy Issues	PI1	I am concerned that the information I will disclose when using reporting applications would be misused.	Hossain & Prybutok, 2008, Dickens & Cook, 2006
	PI2	Reporting anonymously is an important feature of reporting applications.	
	PI3	I am concerned about providing personal information when I use reporting applications.	
	PI 4	I am concerned that my private information would not be protected by law when I use reporting applications.	
Trust	T1	Mobile reporting applications are trustworthy.	Armida, 2008
	T2	I trust that government agency will be transparent.	
	T3	I think government agency will accept criticism.	
Participation Cost	PC1	I will use reporting applications regardless of the cost	W & Wua, 2005
	PC2	I will use reporting applications only if they are free	
	PC3	I think reporting applications will waste my time	
	PC4	Using reporting applications worth my time	
Hedonic Motivation	HM1	Using reporting application is fun	Venkatesh et al, 2012
	HM2	Using reporting applications is boring.	
	HM3	Using reporting applications is entertaining	

Construct	Factor	Qualitative Data	Item	Statement
Expectancy (Instrumentality and Valance)	Appreciation & Recognition	*Someone would like to be known for good deeds. You know everyone in our society likes to have a good reputation so I think many people will participate in these applications you are talking about as long as there is way to thank them. Don't forget there are some people who are not waiting for even thanks. They are doing it for fun or other reasons.*[FG2P6]	E1	I predict if I use reporting applications then I will receive a reward.
			E2	I predict my using of reporting applications will be appreciated by government.
			E3	I feel good when others appreciate my contribution to the community via reporting applications.
		It may not take a lot of my time to report something but what will I get back in return? Will the ministry of commerce acknowledge my use of this application? and how will they do that? I doubt it because they will be busy with more important stuff.[Interview # 1]	E4	Getting recognition from a government will affect my choice to use reporting applications.
			E5	I value what others think of me more than any other participation reward.
			E6	I feel good when I am recognized for being a good citizen.
	Monetary Rewards	*In my view, money is the biggest incentive to use this application especially if no one forces me to use it. If some shops cheated on me, then I do not need any money to report it but if we are talking about reporting a pothole on the street somewhere away from my house then I would like some money. I am not selfish but nothing is free these days*[FG3P1]	E7	I will use reporting applications only when government pays me to use them.
			E8	I will use reporting applications even when I do not receive monetary reward.
			E9	I value money more than any other participation rewards.
	Positive Outcome of Participation	*I will tell you one thing and I swear this is the only thing that will make me decide to use this application or not. I do not need anything from the government. I only want them to listen. I want them to do something about my report when I send it. Imagine the disappointment if I report something but they do not care or they do not fix the issue, do you think I will use this app? no one would! I think I will use the app for the first time assuming my report will not go to waste but this one time may become the only one if I do not see tangible*	E10	I will use reporting applications if the government responds to my reports.
			E11	I predict that government agencies will respond to my reports.
			E12	I will use reporting applications when I am certain there will be a positive outcome for my report.

Construct	Factor	Qualitative Data	Item	Statement
		benefits. Also, If they react well to my report I will ask all of my brothers to use this app because it works. [Interview # 2]		
	Philanthropy	*I am not judging "participant name" who thinks he will only use it if they give him money. But myself and I know many people will use it as "Sadaqah". I am student and I don't have money to spare so helping others by using this free app is a good way to give charity.*[FG3P6]	E13	I believe reporting applications will benefit the whole community.
			E14	I consider using reporting application as a form of giving charity.
			E15	Reporting violators is a form of giving back to my community.
	Measurable Actions	*Seeing that I helped my country by reporting shops that violate commercial laws will make me feel good. This good feeling means a lot to me and my only fear is that nothing will be done regarding my report. I want to see what happens after I send a report.*[FG2P2]	E16	Tracking my reports is very important feature to me when I use reporting applications.
			E17	Getting feedback is very important to me when I use reporting applications.
			E18	If I do not know what happened to my report then I will not use the reporting app again.
	Solving Problems	*If this app will solve the problem, and lower number of cheating accidents then I will not hesitate to use it. Nothing is more rewarding than seeing good result of my actions.*[FG5P1]	E19	I will use the reporting applications if my report solve the problem.
			E20	Using reporting applications will make solving community problems easier.
			E21	Seeing positive results of my report is very rewarding.
	Frustration	*I can guarantee you all people I know will use the app. Do you know why? Because people are angry about stuff like that and they are hungry for change. So I do not need a reward or money to use this app, it is enough for me to ease my anger.*[FG1P1]	E22	I will be using reporting applications because I am frustrated about community issues.
Construct	**Factor**	**Qualitative Data**	**Item**	**Statement**

Sense of Community	Community Membership	*I'm motivated to participate by the feeling that I'm part of the community and I can give people the information they need. I might not get a direct benefit if I tell the government about the problem, but using this system will make me believe I'm a good citizen of Saudi Arabia[FG3P3]*	SC1	Being a Citizen of Saudi Arabia makes me feel good.
			SC2	I think using the reporting applications will make me a better citizen.
			SC3	I believe that using reporting applications will enhance my feeling of belonging to my community.
	Influence in Community	*Let's be honest. We're all Saudis and we know that we have a minimum influence in our country's policy. We don't have elections like other countries and I do not want to talk too much about this topic. You all know that using a system to inform the government agency that my street has a pothole is not a big thing, but I really crave the ability to change stuff. I want to tell my friends the government fixed the street just because of me! [FG4P2]*	SC4	I believe using reporting applications will allow me to introduce positive change in my community.
			SC5	Reporting applications will allow me to have positive influence on my community.
			SC6	I care about what is happening in my community.
	Integration, Satisfaction and Fulfillment of Needs	*When I download the application on my phone and participate by using it, I really want to see an actual result of my participation. Do not get me wrong, I would like them to give me some cash for my contribution but I care more about knowing my participation does not go to waste[FG1P5]*	SC7	Reporting applications will make the government successful in meeting the needs of citizens.
			SC8	I think using reporting applications will help me in getting what I need.
			SC9	I feel satisfied when the government listens to my reports.

Construct	Factor	Qualitative Data	Item	Statement
Cultural Values	**Resistance To Change**	*Nothing can be changed. We are very resistance to change. I do not think government will listen to us. So why bother to use technology to report? We do not need to pretend this app will change the fact that this is who we are. If these applications are working in England or Canada, that does not mean they will work here.* [FG4P2]	CV1	I believe Government agencies will ignore my report
			CV2	Using reporting applications will result in no solution..
			CV3	I think using reporting applications will help in changing us to a better community.
	Nepotism	*I come from a small village in the southern part of the Kingdom. Most if not all of the shops owners are my cousins. I will find it very difficult to report my tribe members to the government even if they do something wrong.*[FG4P3]	CV4	I will use reporting applications to report a problem or violation even when it caused or relevant to someone I know.
			CV5	I will use reporting applications to report violators regardless of their identity or their relationship to me.
			CV6	I will report my friends and family members if they violate the law.
	Religious View	*Islam is the religion of forgiveness. Our prophet has advised us to cover others mistakes and forgive them. I think this app is contradicting the forgiveness concept. Is there any way to warn the shop owners instead of reporting them to the government?* [FG5P3]	CV7	Using reporting applications does not contradict my religious beliefs.
			CV8	I believe using reporting applications is a good deed.
			CV9	Covering violators mistakes and forgiving them is better than using reporting applications to report them.
	Gender in Saudi Culture	*Yes there will be difference in using these applications between men and women. Women in our country will use it more because they have more time and they also go to the shops more than men which will make them encounter cheating and violations. I am talking about myself, but some of my female friends will just tell their male guardians about what happened. They will not use the app to report because many families do not think it is okay for their daughters to give personal information.*[Interview #4]	CV10	Women will use the reporting applications more than men.
			CV11	Saudi women and men will use reporting applications for the same purpose.
			CV12	Men will use reporting applications more than women.
			CV13	Women and men will equally use the reporting applications.
			CV14	Government will respond to men reports better than women reports.
			CV15	I feel Reporting Applications will harm others.

3-5 Survey Items

A seven-point Likert Scale was used in the survey ranging from 'strongly agree' to 'strongly disagree'. Using an odd number of scale points is important so as to give the participants an option of 'neutral' (Ozok, 2008). The survey began with the consent form and a voluntary participation declaration. The participants were provided with contact information of the researcher, and IRB at UMBC in case they had any questions. Following the consent form, the participants were presented with two examples and a brief description of two existing incidents reporting mobile applications that exist in Saudi Arabia. The goal was to introduce the concept and to make clear the study purpose for those who had never used such systems. The survey findings showed that 76% of the respondents had never used any reporting applications in the past, which supports giving the example, despite the bias caused by these examples. This bias was inventible because it was logical for participants to think about these examples when completing the survey. However—and despite the fact that both examples were used for incidents reporting—they are designed to report different kinds of incident; one of them was designed to report violation by shops and shop owners (financial), whereas another was used to report abandoned uncovered wells in an effort to prevent death or injuries resulting from falling (environmental and humanitarian). This distinction between the two applications' purposes may have helped in lowering the bias effect.

The final version of the survey comprised 77 items measuring 12 model constructs. These items excluded the demographic questions component. All of the questions were translated from English to the native language of Saudi citizens— Arabic. Although Arabic is my mother language (I am fluent in English, too), a professional translator assisted with translating the survey questions to Arabic to enhance its accuracy. Conducting a pre-test was a crucial step to ensuring the content and face validity of the survey questions.

After the survey was developed, it was sent to a dissertation committee member, who is an expert in survey research. He provided suggested edits, and stressed the importance of providing participants with description and examples of incident reporting applications. His feedback and change suggestions were implemented in the second draft of the survey, and then translated to Arabic. The second edited Arabic draft then was sent to a domain expert, who had done work concerning the acceptance and adoption of models; this was done to verify the internal validity of the survey items. His edits and changes were implemented in the third draft of the survey.

It was also important to pre-test the survey with subjects from the same population that were to be used in the main study. I recruited 6 volunteers from the Saudi Students' Body at UMBC to answer the survey questions. I asked them for feedback to identify any ambiguities and difficult questions. I also recorded the time taken to complete the survey, and decided whether or not such a time was reasonable (average completion time was 17 minutes). Following this pre-test, I reworded any questions that caused problems due to translation from English. In some cases, I had

to re-write the item to ensure it measured the right concept. Finally, in a visit to Saudi Arabia, I recruited 19 participants to fill in the survey once again; resultant changes were minimal. Most of the survey takers during the pre-test complained about some redundancy in the questions; this issue was caused by my attempts to capture the respondents that had not paid attention whilst completing the survey. A few participants also commented on the consent form language: they were not comfortable with the many assurances pertaining to the anonymity and the voluntary nature of their participation; they thought this may encourage hesitant participants to choose not to complete the survey questions. Unfortunately, there was nothing I could do about this issue: as a researcher I have to follow the template and wording of the consent form provided by the Institutional Research Board at UMBC .In the next, section a data analysis procedure will be detailed.

3.4.2 Survey Data Analysis

The analysis plan of collected data will be described in the following four sections: (1) Characteristics of the respondents; (2) Descriptive analysis of responses to the survey instrument; (3) Descriptive statistics of the latent variables; and (4) Model to predict Usage intentions to accept and use Technology Mediated Social Participation Systems (TMSP systems).

Several of the recent technology acceptance studies have used PLS for analysis. Venkatesh, Morris, Davis& Davis (2003)used partial least squares regression procedures to develop the measurement and structural models, whilst Davis (1989) used path analysis with the original TAM instrument(Davis, 1989). The structure model was created by analysing the path coefficient amongst constructs.

1. *Characteristics of the Respondents:*

The frequency distributions (counts and percentages) of the responses to eight (8) items reporting the demographic characteristics of the 684 respondents (sex, age, nationality and occupation), and their use of Smart Phones and mobile reporting apps were tabulated using the 'Frequencies' procedure in SPSS.

2. *Descriptive Analysis of Responses to the Survey Instrument:*

The responses to the 77 items listed in Table 3.6 based on a 7-point rating scale (1 = Strongly Agree, 2 = Agree, 3 = Sometimes Agree, 4 =Neutral, 5 = Sometimes disagree, 6 =Disagree, and 7 = Strongly Disagree) were imported into the data editor of IBM SPSS vs. 20.0 The frequency distributions (counts and percentages) of the responses were tabulated using the 'Frequencies' procedure in SPSS.

3. Descriptive Statistics of the Latent Variables

A latent variable from the Latin: *lateo* ('lie hidden') represents an underlying construct or complex concept that cannot be directly measured by a researcher using only a single value. A latent variable must be created by the researcher using mathematics to aggregate a group of directly measured attributes of the construct (e.g., multiple questionnaire item scores) called indicators. The process of aggregating multiple measurements to create latent variables is called 'operationalization' (Tabachnick & Fidell, 2012).

Table 3.6 lists the 77 indicators aggregated in groups to operationalize the 12 latent variables. The most important rule for operationalizing a latent variable is that all the indicators in a group must measure the attributes of a construct in one logical direction. This rule is broken if the indicators measure the attributes of a construct in opposite directions (e.g., using a mixture of both positively and negatively worded items) so that the item scores are negatively correlated and the average covariance is negative (Tabachnick & Fidell, 2012)

Twelve items in Table 3.6 (coded by R, highlighted in bold) used items that were worded in the opposite direction to the other items in the same group. For example, the two items used to operationalize Hedonic Motivation: '*HM01: Using reporting application is fun*' and '*HM03: Using reporting apps is entertaining*' were positively worded. These items measure Hedonic Motivation in the opposite direction to the negatively worded '*HM02R: Using reporting apps is boring*'. The analysis of latent variables operationalized using oppositely worded items produces misleading results because the constructs cannot be validated or reliably measured (Barnette, 2000; Nancy Wong, 2003; Pilotte & Gable, 1990).

Latent Variable	Indicator
Performance Expectancy	PE01: I find reporting apps useful in incident reporting.
	PE02: Using reporting apps would enable me to report more quickly.
	PE03: Using reporting apps would increase the effectiveness of my participation in the community.
	PE04: Using reporting apps to report an incident will result in taking care of this issue.
Effort Expectancy	EE01: My interaction with reporting apps would be clear.
	EE02: It would be easy for me to report using mobile reporting apps.
	EE03: I would find reporting apps easy to use.
	EE04: Learning how to send a report will be easy for me.
Social Influence	SI01: People who influence my behavior think that I should use reporting apps.
	SI02: People who are important to me think that I should use reporting apps.
	SI03: I will use mobile reporting apps because my friends are using them.
Facilitating Conditions	FC01: I will have a Smartphone to use reporting apps.
	FC02: I will have the knowledge necessary to use the mobile reporting apps.
	FC03: I can download reporting apps on my phone.
Usage Intention	UI01: I intend to use reporting apps in the near future.
	UI02: I predict I would use reporting apps to report in the near future.
	UI03: I plan to use reporting apps in the near future.
Privacy Issues	PI01: I am concerned that the information I will disclose when using reporting apps would be misused.
	PI02: Reporting anonymously is an important feature of reporting apps.
	PI03: I am concerned about providing personal information when I use reporting apps.
	PI04: I am concerned that my private information would not be protected by law when I use reporting apps.
Trust	T01: Mobile reporting apps are trustworthy.
	T02: I trust that government agency will be transparent.
	T03: I think government agency will accept criticism.
Participation Cost	**PC10R:** I will use reporting apps regardless of the cost
	PC02: I will use reporting apps only if they are free
	PC03: I think reporting apps will waste my time
	PC04R: Using reporting apps is worth my time
Hedonic Motivation	HM01: Using reporting application is fun.
	HM02R: Using reporting apps is boring
	HM03: Using reporting apps is entertaining.
Cultural Values	**CV10R**: I believe government agencies will ignore my report
	CV20R: Using reporting apps will result in no solution
	CV03: I think using reporting apps will help in changing us into community.
	CV04: I will use reporting apps to report a problem or violation even when it caused or relevant to someone I know.
	CV05: I will use reporting apps to report violators regardless of their identity or their relationship to me.
	CV06: I will report my friends and family members if they violate the law.
	CV07: Using reporting apps does not contradict my religious beliefs.
	CV08: I believe using reporting apps is a good deed.
	CV09R: Covering violators mistakes and forgiving them is better than using

	reporting apps to report them.
	CV10R: Women will use the reporting apps more than men
	CV11: Saudi women and men will use reporting apps for the same purpose.
	CV12R: Men will use reporting apps more than women.
	CV13: Women and men will equally use the reporting apps.
	CV14R: Government will respond to men reports better than women reports.
	CV15R: I feel Reporting apps will harm others
Sense of Community	SC01: Being a citizen of Saudi Arabia makes me feel good.
	SC02: I think using the reporting apps will make me a better citizen.
	SC03: I believe that using reporting apps will enhance my feeling of belonging to my community.
	SC04: I believe using reporting apps will allow me to introduce positive change in my community.
	SC05: Reporting apps will allow me to have positive influence on my community.
	SC06: I care about what is happening in my country.
	SC07: Reporting apps will make the government successful in meeting the needs of citizens.
	SC08: I think using reporting apps will help me in getting what I need.
Expectations	**E10R**: I predict if I use reporting apps then I will receive a reward.
	E02: I predict my using of reporting apps will be appreciated by government.
	E03: I feel good when others appreciate my contribution to the community via reporting apps.
	E04: Getting recognition from a government will affect my choice to use reporting apps.
	E05: I value what others think of me than any other participation reward.
	E06: I feel good when I am recognized for being a good citizen.
	E07: I will use reporting apps only when government pays me to use them.
	E08: I will use reporting apps even when I do not receive monetary reward.
	E09: I value money more than any other participation awards.
	E10: I will use reporting apps if the government responds to my reports.
	E11: I predict that government agencies will respond to my reports.
	E12: I will use reporting apps when I am certain there will be positive outcome for my report.
	E13: I believe reports apps will benefit the whole community.
	E14: I consider using reporting application as a form of giving charity.
	E15: Reporting violators is a form of giving back to my community.
	E16: Tracking my reports is very important feature to me when I use reporting apps.
	E17: Getting feedback is very important to me when I use reporting apps.
	E18R: If I do not know what happened to my report then I will not use the reporting app again.
	E19 I will use the reporting apps if my report solve the problem.
	E20: Using reporting apps will make solving community problems easier.
	E21: Seeing positive results of my report is very rewarding.
	E22: I will use reporting application because I am frustrated about violations.

3-6 Items Used To Operationalize Latent Variables

To ensure that all of the item scores measured their corresponding latent variables in one logical direction, the 12 items with labels coded by R in Table 3.6 were reverse scored (i.e., 7 = Strongly Agree, 6 = Agree, 5 = Sometimes Agree, 4 =Neutral,3 = Sometimes disagree, 2 = Disagree, and 1 = Strongly Disagree). Reverse scoring was achieved in the SPSS data editor by subtracting the recorded item scores from 8 (Field, 2013). The reversed scores, however, could compromise the results of structural equation modelling (DiStefano & Motl, 2006).

After reversing the scoring of the oppositely worded items, the latent variables were operationalized by averaging the clusters of item scores in Table 3.6 so that each latent variable was scored from 1 to 7 for each participant. The twelve latent variables were summarised across the 684 respondents using the 'Descriptive Statistics' procedure in IBM SPSS. The mean score, the standard deviation, and the median score for each latent variable were computed. The normality of each latent variable was checked using histograms, skewness statistics, and Kolmogorov-Smirnov (K-S) tests. A comparison was made between the scores of the male and female respondents, as well as between respondents who answered 'Yes' or 'No' to the question: 'Have you ever used reporting apps?'

4. *Model to Predict Usage Intentions*

An appropriate statistical modelling methodology was chosen to provide evidence based on the survey to address the following research question: '*How are different motivational factors associated with the intention of using the TMSP systems?*'

The method chosen to test the hypotheses was structural equation modelling (SEM). Two different SEM techniques could potentially be used, either covariance-based (CB-SEM) or partial least squares-based (PLS-SEM).CB-SEM is a parametric

method reproducing the covariance matrix to explain the relationships between the latent variables. CB-SEM uses a maximum likelihood estimator (MLE) to fit the data to the proposed model. Goodness of fit (GoF) tests is used to determine whether the model should be accepted or rejected. PLS-SEM, in contrast, operates by maximising the explained variance to predict the relationships between the latent variables. PLS-SEM uses an iterative algorithm to compute the model parameters, but GoF tests are not justified in testing the goodness of fit of the data(Hair, Hult, Ringle, & Sarstedt, 2014).

CB-SEM is underpinned by the classical parametric statistical framework, assuming that the latent variables are normally distributed and measured at the interval level. PLS-SEM, in contrast, is a non-parametric method, with less restrictive data requirements. PLS-SEM is not so sensitive to the distributional and measurement characteristics of the variables, and operates with scores that deviate from normality measured at the interval, ordinal and nominal level. Consequently, PLS-SEM is most useful for analysing variables with skewed distributions, based on scores that violate the assumptions of parametric statistics(Hair et al., 2014; Wong, 2013)

Before a decision could be made as to whether CB-SEM or PLS-SEM should be used in this study; a preliminary analysis of the questionnaire data response was conducted. Due to violations of the assumptions of CB-SEM (including strong deviation from normality), as reported in the results chapter (see chapter 5), the method selected by the researcher to address the research of this study was PLS-SEM. Models were constructed using SmartPLS software and downloaded from the developers' website (www.smartpls.de), following the protocols described by Wong(2013)

SEM is sensitive to multicollinearity or multiple inter-correlations between predictor variables. Multicollinearity causes redundancy, meaning that the model is over-specified with too many predictors. Correlations between multicollinear variables may be attenuated (misleadingly low), and the statistical inferences are compromised. Multicollinearity is considered a serious problem in PLS-SEM 'if not handled well'(Wong, 2013). The method described by Hair et al .(2014), based on multiple regression analysis in SPSS to compute variance inflation factors (VIF) and Tolerance, was used to determine whether multicollinearity was a serious issue. Tolerance below 0.20 and VIF above 5.00 would indicate that multicollinearity was too high, and that consideration should be afforded to eliminating or merging the correlated latent variables.

The graphic user interface of SmartPLS was used to construct the path diagrams consisting of the measurement (outer) models and the structural (inner) models. The entire measurement model consisted of the 77 indicators. The indicators were linearly combined by composite factor analysis to operationalize the twelve latent variables, represented by the oval symbols. The factor loadings (i.e. the correlations between the latent variables and their constituent latent variables) are symbolised the arrows between the latent variables and the indicators. The structural model consisted of the relationships between the eleven predictor variables and the single dependent variable, as measured by the path coefficients.

3.4.3   Survey Validity and Reliability

It is important to ensure the reliability and validity of the proposed model. The evaluation can be achieved by examining the reliability analysis and the construct

validity (convergent and discriminant). Reliability analysis has been performed to examine the inter items consistency of the measurement model.

Convergent validity is a function of the association between two different measurement scales intended to measure the same concept, and is achieved when multiple indicators operate in a consistent manner (Gefen & Straub, 2005). Constructs have convergent validity when the composite reliability exceeds the criterion of 0.70 and the average variance extracted is above 0.50.

Discriminant validity is the extent to which scales reflect their suggested construct differently from the relation with all other scales in the research model (Gefen & Straub, 2005). Discriminant validity is assessed by comparing the square roots of Average Variance Extracted (AVE) to the inter-factor correlations between constructs.(Hair et al., 2014; Wong, 2013).

The quality criteria for assessing the validity of the measurement model were applied(Hair et al., 2014; Wong, 2013). All the factor loading coefficients must be strong, and there is debate concerning the threshold of factor loading. Hair et al. (1998) give rules of thumb for assessing the practical significance of standardised factor loadings. He argues that factor loading coefficient can go as low as 0.30 with a sample size of 350 or larger. As will be shown in chapter 5, this study has adopted two thresholds: items that are adapted from well-validated instruments in the literature, such as UTAUT constructs, have a threshold of >0.7, whereas items developed based on qualitative data have a threshold of >0.40. The study sample is double that of the size of the rule of thumb recommended by Hair et al(1998.)

The AVE by the indicators that comprised each latent variable should exceed 0.5 to reflect good convergent validity. Discriminant validity was indicated if the factor loading coefficients for the items that constituted each latent variable were greater than their cross-loadings on the other latent variables. The internal consistency reliability of each latent variable was indicated if its composite reliability coefficient was > 0.7.The effect size given by R^2 (the proportion of the variance explained) should exceed 25%. If the measurement model did not satisfy these quality criteria, then it was justified to delete the indicators contributing little or nothing to the explained variance and reliability.

Following the evaluation of the quality of the measurement model, the structural model was then constructed and tested for statistical significance. The statistical significance of each path coefficient between the latent variables was estimated by bootstrapping, based on the Monte Carlo method. The item scores were randomly sampled with replacement for 5,000 times with 684 cases in each sub-sample. The mean and standard error was computed for each path coefficient. If the t-statistic (t = mean/standard error) was > 1.98, then the path coefficient was significantly different from zero at the conventional.05 or 5% level of significance (Hair et al., 2014; Wong, 2013).

Chapter 4: Constructing the Culturally-Relevant TMSP Systems Acceptance Model

This chapter reports on the qualitative results of the first phase of the dissertation project. The results of the field work reported here directly informed the development of the culturally-relevant TMSP system acceptance model by confirming the appropriateness of constructs used in previously published instruments as well as suggesting new constructs not previously used. The first half of the chapter describes the relevant results from the focus groups and follow-on interviews. The latter half demonstrates the fit of existing constructs and the construction of new constructs. It concludes with the definitions of the final contextual model constructs and their supporting hypotheses.

4.1 Identifying TMSP Systems Adoption Factors

This research is concerned with identifying the key motivational factors for the acceptance and adoption of TMSP systems in Saudi Arabia. The first phase of this study was exploratory in order to clarify and define the nature of the problem. A thorough literature review has been done to find constructs relevant to the proposed model. To identify further adoption factors, focus group and individual interviews have been conducted to (a) deeply understand the research problem, (b) develop items to be added to the questionnaire, (c) help in constructing the adoption model, and (d) interview individuals to confirm factors identified in group interviews.

The overall study design has been described in the previous chapter (chapter three). The first phase of this research consisted of two parts: focus groups and individual interviews. In this chapter, the results of the focus groups and individual

interviews will be reported. The proposed model that has been constructed based on the literature review and interview findings will also be reported.

4.2 Focus Group Findings

The results from focus groups show that cultural value and expectations as well as a sense of community all have an impact on usage intentions. The focus group interviews were conducted and analyzed in Arabic. Keywords were manually extracted from the transcript, resulting in 60 themes. After the initial analysis and extraction, I went back to the literature to determine whether these keywords aligned well with any existing theoretical constructs.

In order to broadly cover all factors, I linked the extracted themes to the original Unified Theory of Acceptance and Use of Technology(UTAUT) model (Venkatesh et al., 2003).I modified and extended it by integrating it with the Expectancy Theory of Motivation (Vroom, 1964) and the Sense of Community Theory (McMillan & Chavis, 1986). The resulting model was adapted based on themes that emerged from the focus groups. Thematic analysis was used to classify the identified keywords according to the model's constructs. Based on meeting the frequency threshold, 41out of 60 of the extracted subthemes have contributed to the development of the model's 11constructs (Table 4.1).Keywords that were not mentioned at least five times in multiple interviews were not included in the model's constructs.

Cost of technology	Positive outcome	Ease of use
Tangible result	Technological reliability	Transparency
Peer pressure	Acceptance of criticism	Social change
Infrastructure	Monetary reward	Time
Anonymity	Functionality	Feedback
Quick reaction	Role model	Religious views
Frustration	Community membership	Availability
Measurable actions	Problem-solving	Recognition by agency
Saudi culture	Appreciation	Feeling good
Communication	Resistance to change	Effort saving
E-readiness	Influence	Fun
Family members	Usefulness	Nepotism
Legal concerns	Technical support	Giving to charity
Documentation	Indirect benefit	

4-1 Forty-One Themes Extracted From Focus Groups That Contributed To Model Construct Development

When the themes were classified, 19 of them did not fit in with the model constructs (Table 4.2). These outliers were re-evaluated during part two of phase one, the individual interviews.

Awareness	Collaboration for the public good	Education level	Lack of trust
Decision-making	Social loafing	Gender	Effort-to-benefit
Bureaucracy	Ignorance	Age	Despair
Design quality	Technology abuse (Spam)	Enforcement	Information quality
Shared participation	Not a priority	Passive interaction	

4-2 Themes Extracted From Focus Groups That did Not Fit Model Constructs

4.3   Construct Formation Process

The 60 identified keywords have to be mentioned at least five times in different interviews to be grouped into one of the model's 11 constructs. Figure 4.1 illustrates the construct formation process.
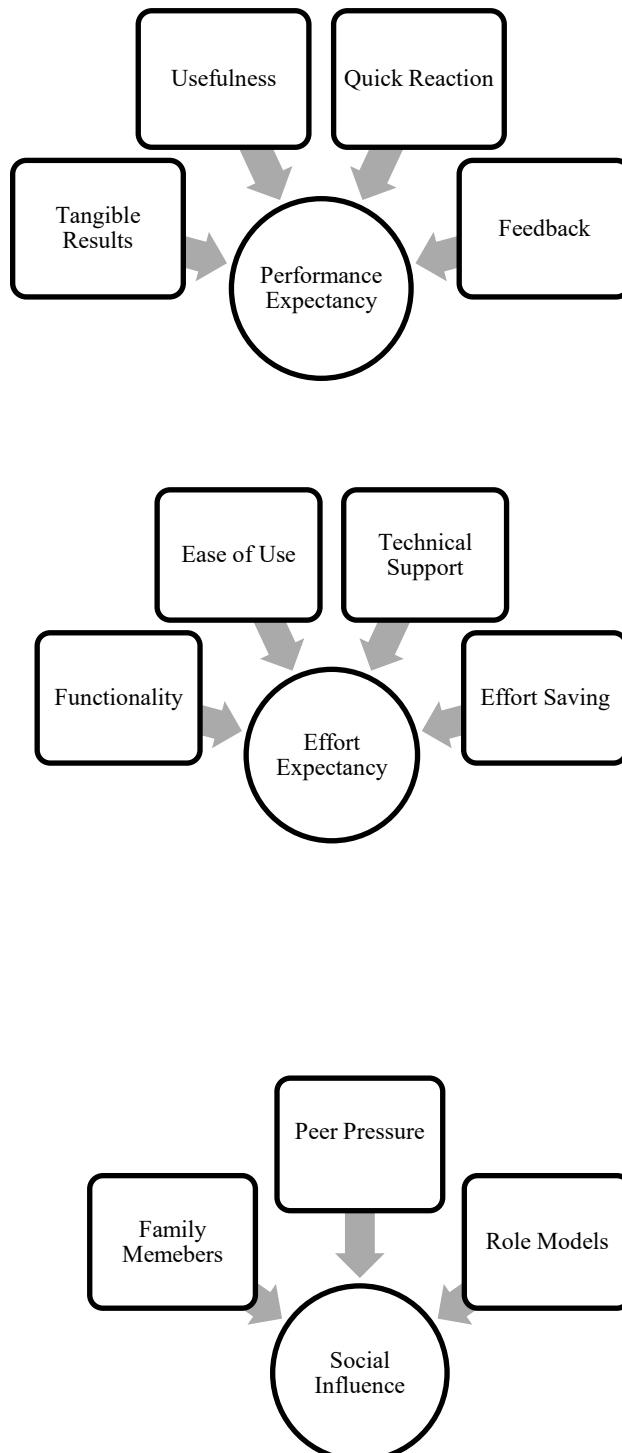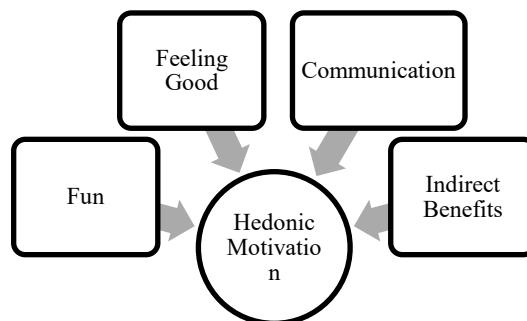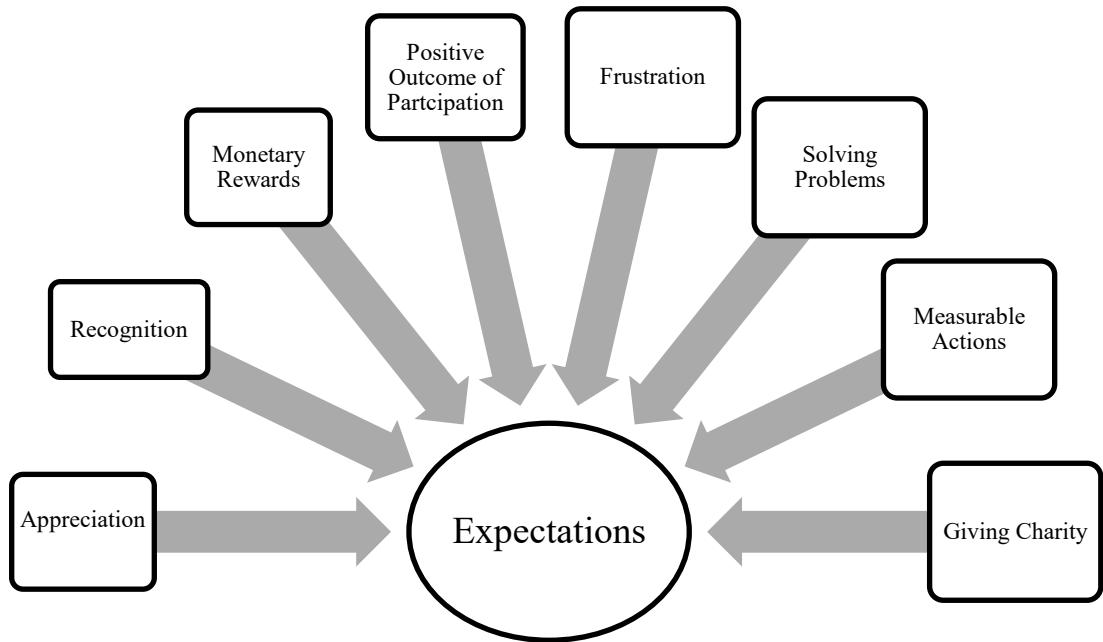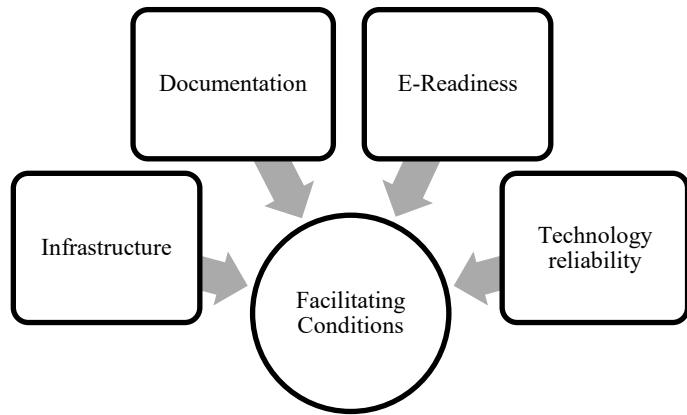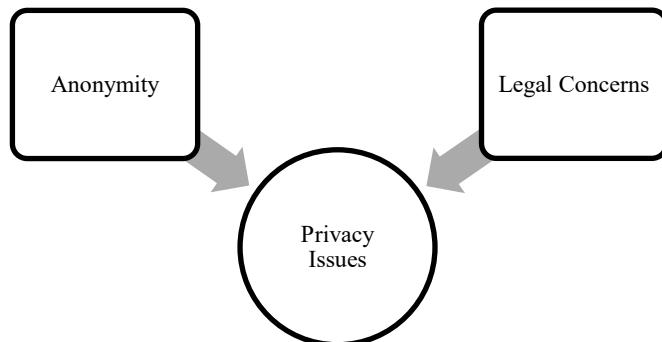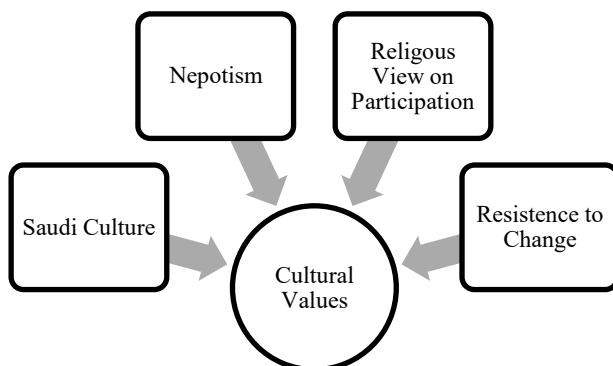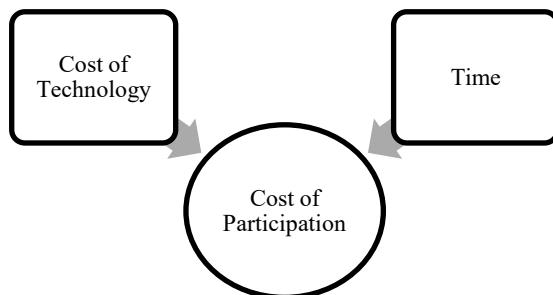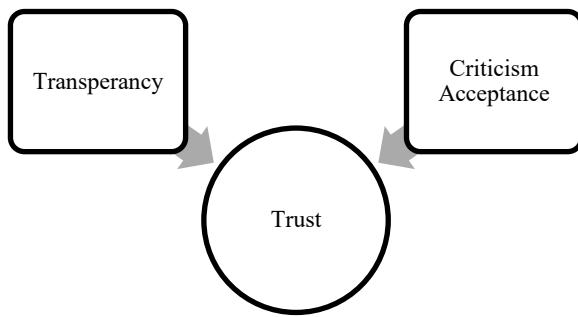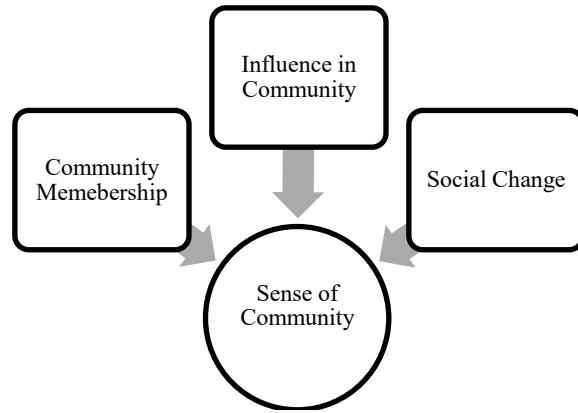
FIGURE 4.1 Constructs Developmet Process

The proposed model has adapted four constructs from UTAUT: one from the expectancy theory of motivations, one from the sense of community theory, and one fromtheUTAUT2 model. In addition to these extant constructs, I identified new ones that are relevant to TMSP systems adoption in Saudi Arabia (Table4.3). The additional constructs were developed based on the literature review and focus group findings.

Model/Theory/Participants	Constructs
UTAUT	Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition
Expectancy Theory of Motivations	Expectations
Sense of Community Theory	Sense of Community
UTAUT2	Hedonic Motivation
Focus Groups & Literature Review	Cultural Values, Trust, Cost of Participation, Privacy Issues

4-3 Model Construct Development

In order to determine the importance of each of these themes, the number and distribution of the comments for each construct were reported in Table 4.4. The most discussed constructs were sense of community, cultural values, and social influence, in that order. In addition, cost of participation, effort expectancy, and trust were the least discussed constructs.

Model Constructs	Number of Comments
Sense of Community	113
Cultural Values	105
Social Influence	96
Expectations	94
Performance Expectancy	80
Privacy Issues	76
Facilitating Conditions	45
Hedonic Motivation	41
Cost of Participations	39
Effort Expectancy	30
Trust	23

TABLE 4-4 COMMENTS FREQUENCY OF CONSTRUCTS

4.4 Individual Interview Findings

Individual interviews were conducted to confirm the findings of the focus groups. They also helped to deepen my understanding of specific factors affecting the acceptance of TMSP systems.

Interview participants were presented with the aggregate findings of the focus group and asked to refine and check the accuracy of the identified factors.At the end of each interview, I presented the individual with the 60-keyword table and I highlighted the terms that contributed to the model building. Then, I asked about the rest of keywords that did not make it to the model (outliers), and if they think they should be considered or not. It was through this process where I had to add the gender to the cultural values construct because five out of my seven participants indicated

their importance. Outliers from focus groups that are supported in individual interviews were added to the model constructs. However, themes that were not viewed as significant by multiple participants in the focus groups and interviews were removed from the model and considered beyond the study scope.

One of the interesting keywords that was determined to bean outlier based on focus groups findings was gender. However, five out of seven participants in the individual interviews emphasized the importance of including gender in themodel'scultural values construct. They believed that segregation between genders in the Kingdom of Saudi Arabia is very unique and that it must affect the acceptance and usage of new technologies.

In relation to the cultural values construct, the individual interviewees confirmed the belief that social and contextual factors rather than technological factors contribute to a lack of acceptance of new technology in Saudi Arabia. In particular, citizen expectations and the way governmental agencies handled reports factored into the rejection of a TMSP system.

Increasing awareness of the use, benefits, and broader impact of TMSP systems was identified in the individual interviews as one of motivating factors behind the acceptance of TMSP systems. Three participants blamed the governmental organization for citizens' lack of knowledge about these systems.

Finally, most of the qualitative findings and model development processes were a result of the focus group sessions. The individual interviews served as a backup channel to confirm earlier findings (chapter six has a detailed discussion of interview findings).

4.5 Research Model

In this study, I adapted the UTAUT model to uncover the factors that influence citizens to accept and adopt TMSP systems. This model has been chosen due to the fact that it represents the most integrative and recent set of the technology acceptance and adoption models and theories that have been discussed in chapter two of this dissertation. UTAUT validity, reliability, and accuracy have been demonstrated in the literature of technology adoption. Figure 4.2 is a graphical representation of the research model.
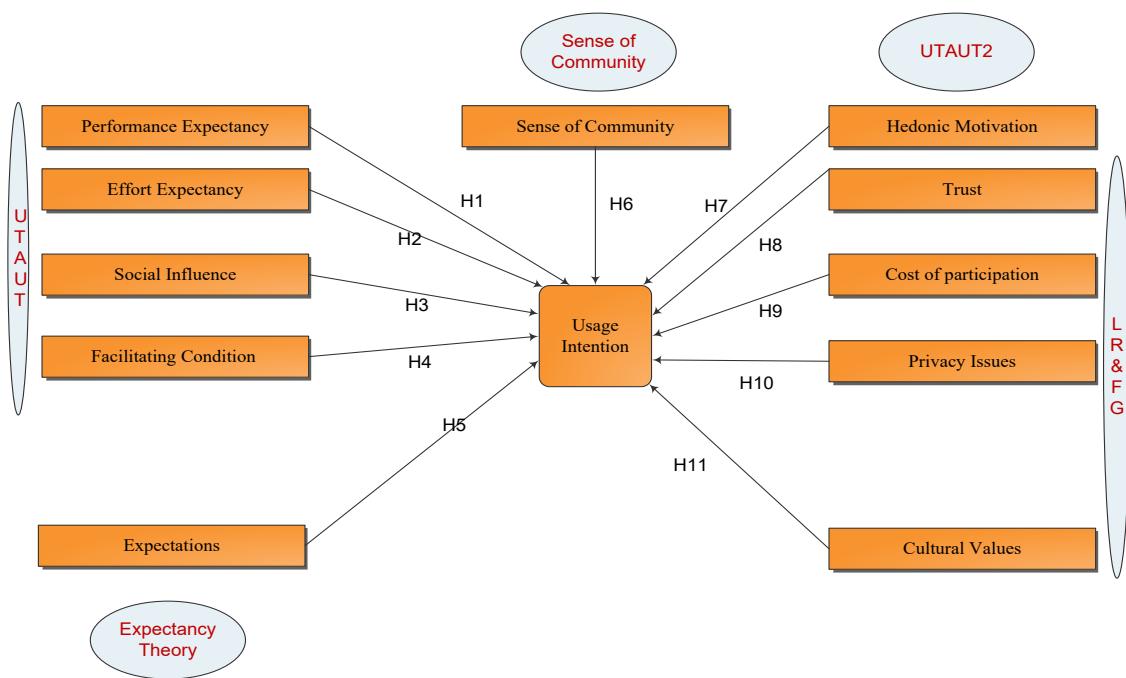
FIGURE 4.2 TMSP Systems Acceptance Model

4.6 Model's Constructs Definitions

In this section, the research model constructs will be discussed. The presented TMSP systems acceptance model contains 11 constructs that are hypothesized to have an influence upon its intended usage bycitizens of Saudi Arabia and whether they accept and adopt TMSP systems that are designed to be used in the public domain. Each of the constructs is discussed below, with each subsection culminating in the related hypothesis to be tested in the eventual model evaluation using the survey instrument.

Performance expectancy

Performance expectancy is defined as the degree to which a stakeholder believes that using technology will help improve job performance. In the context of this study, I can define it as the degree to which a citizen believes TMSP systems will function according to their purpose (Are these systems technically functional?). This construct is captured from different constructs that existed in the technology acceptance literature (see chapter 2): perceived usefulness (TAM), extrinsic motivation (motivation models), and outcome expectations (social cognitive theory). It is worth mentioning that this construct deals not with the technology artefact performance but the outcome expectation and thus may overlap with another construct in the model (Expectations).

It is argued that this construct has the most influence on the intended use of technology (Venkatesh et al., 2003a). The literature has extensive evidence of the impact of performance expectancy on usage intentions (Alshehri, Drew, Alhussain, & Alghamdi, 2012; Taylor & Todd, 1995). Focus group participants indicated that they were more eager to accept, adopt, and participate in TMSP systems not only if these

systems perform well, but if they were expecting a positive outcome from their participation too. Hypothesis one is that performance expectancy has a positive effect on the intended use of TMSP systems.

Effort expectancy

Effort expectancy is defined as the degree of ease associated with using a particular kind of technology. The following constructs capture the concept of ease of use: perceived ease of use (TAM), complexity (model of PC utilization), and ease of use (innovation diffusion theory). In this research, ease of use refers to the amount of effort a citizen must expend to participate in TMSP systems. Previous empirical studies have proved the impact of effort expectancy on the usage intention (Alshehri et al., 2012; Thompson et al., 1991). TMSP systems that are used for the public good are voluntary in their nature. Hence, it is crucial for such technologies to be easy to use with minimal effort. If these systems require extensive learning, especially a lot of reading, the chances of acceptance and adoption may be low.

Therefore, hypothesis 2 is that effort expectancy has a negative effect on the usage intention of TMSP systems.

Social influence

Social influence refers to the degree to which citizens perceive that others believe they should complete particular tasks. In this study's context, it represents the degree to which citizens perceive that significant people believe they should participate and engage in the community through the TMSP systems in general and reporting systems in particular. This construct is based on three constructs from existing theories: subjective norms (theory of reasoned actions, theory of planned behavior), social factors (MPCU), and image (IDT)(Venkatesh et al., 2003). Focus groups findings

support the impact social influence has on the use the TMSP systems. Family members, friends, and peers may have a positive or negative impact on someone's decision to adopt a piece of technology. Social Influence is expected to have a larger impact on people who are using systems for the first time and less impact on those who are already using them (Venkatesh, 2000). As such, hypothesis 3states that social influence has a positive effect on the usage intention of TMSP systems.

Facilitating conditions

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the systems (Venkatesh et al., 2003b). Users of TMSP systems need to recognize that the surrounding organizational and technical infrastructure support their adoption of such systems. Citizens need to have the ability, knowledge, and resources required to use such systems. The government agencies that develop TMSP systems and mobile applications that encourage public participation should provide the needed technical support for citizens. Lack of technical or organizational support may lead to lack of adoption. There is extensive empirical evidence showing the significant effect of facilitating conditions on usage intention (Attalla, El-Moursy, & Abdel-Wahab, 2012; Lu, 2003).

Therefore, hypothesis 4is that facilitating conditions have a positive effect on the usage intention of TMSP systems.

Expectations

Expectations are a mix of instrumentality and valance. Instrumentality is one of the beliefs of the expectancy theory advanced by Vroom (1964). This theory states that people have different goals and can be motivated if there is a positive relationship between effort and performance. Instrumentality can be described as the belief thatif a citizen performs well (engages in their community and participates by using TMSP systems), then a valued outcome will come to that citizen. It represents how confident the citizenisthat his or her participation will lead to an actual outcome. It also represents the belief that if someone does meet performance expectations by adopting and participating in TMSP systems, he or she will receive a greater reward. This reward may come in the form of money, recognition, or a sense of accomplishment. Interviewfindings showed that when people trust that their participation will lead toanactual outcome, they feel accomplished and their adoption of TMSP systems and usage intention may increase as a result.

Valance is also one of the beliefs of the expectancy theory of motivation(Vroom, 1964). The valance refers to the value the individual personally places on the rewards. This is a function of his or her needs, goals, and values. In this study context, citizens are expected to adopt and use TMSP systems if the value of their participation is high. This value varies among people, but generally, focus group participants indicated that although people have different valuations of the participation rewards, the valance may have an influence on usage intention. They also indicated that focusing on the valance when designing TMSP systems may increase their adoption rate.

One of the problems with the valance is that it is impossible to target the value that people place on their participation rewards. Some participants may value recognition more than monetary reward and vice versa. Hypothesis 5 is that expectations have a positive effect on usage intention of TMSP systems.

Perceived sense of community

Sense of community can be defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together"(McMillan &Chavis, 1986).. Many focus group participants mentioned that they are willing to adapt such systems because they believe their participation will increase their feelings of community membership. They also believe that this piece of technology will promote a feeling of influence when they work toward the common public good of their community. Previous studies show that people with a strong sense of community tend to commit to, support, and exchange information with others(Wellman, 1998). TMSP systems used for the public good are designed to exchange information between citizens and governmental agencies. Hypothesis 6 is that a perceived sense of community has a positive effect on TMSP systems usage intention.

Hedonic motivation

Hedonic motivation refers to the perception that users will want to perform an activity solely for the enjoyment of engaging in the activity itself. Venkatesh, Thong, and Xu (2012) added hedonic motivation to UTAUT2, describing the fun or pleasure derived from using a technology as a predictor of usage intention. Several studies(Van

der Heijden, 2004; Venkatesh et al., 2012) have revealed that hedonic motivations are conceptualized as perceived enjoyment. In the context of TMSP systems, hedonic motivation refers to the degree of pleasure citizens' experience when using TMSP systems to participate and engage in their community. Many TMSP systems researchers studied these as incentivizing factors for acceptance and adoption (see chapter 2). Techniques such as gamification are used to enhance the hedonic nature of these systems. Previous studies suggest there is an existing link between perceived enjoyment and usage intention (Turel, Serenko, & Bontis, 2007). Therefore, hypothesis 7 is that hedonic motivation has a positive effect on the usage intention of TMSP systems.

Trust

Trust is the willingness to be vulnerable to the actions of another person or group. Providing a trustworthy environment is a crucial measure to increase the acceptance and adoption of TMSP systems. Shneiderman (2000) has stated, "Trust is a positive expectation a person has for another person or an organization based on past performance and truthful guarantees". Due to the nature of TMSP systems and the lack of face-to-face interaction between citizens and governmental agencies, there might be a lack of trust. A lack of trust could negatively affect the usage intention of technology(Palvia, 2009). Focus group participants indicated that trust may be either a motivational factor or a barrier to the use of TMSP systems. They stated that trusting the government agency requires them to establish transparency in terms of how they handle reports by citizens. Citizens also need assurance that reporting violations using one of the TMSP systems will not harm them. Hypothesis 8 is that trust has a positive effect on the usage intention of TMSP systems.

Cost of participation

The cost of participation is the degree to which the citizen recognizes the possible expenses of participating in their community using one of the TMSP systems. According to behavioral decision theory, the cost-benefit pattern is significant to the acceptance and adoption of new technology. Cost in this context is not limited to how much the access to technology costs, but also how much the whole process of participation costs. It includes the amount of time citizens should spend participating in one of the TMSP systems and the consequences of their participation. Focus group findings suggested the importance of the cost as a factor of accepting and using TMSP systems. Thus, I propose hypothesis 9: cost of participation has a negative effect on usage intention of TMSP systems.

Privacy Issues

Privacy issues can refer to multiple concepts based on their context. However, in this research, it refers to information privacy. Participation in TMSP systems usually involves sharing information with other people or organizations. Sharing personal information such as name, address, social security number, or any other identifier is a sensitive issue in TMSP systems. In this study, we are using a mobile app that was developed to report commercial violations. The government agency that launched this mobile application needs some identifiers from citizens in order to prevent faulty reports and hoaxes. However, participants (citizens) find it unappealing to share their personal information for multiple reasons, such as trust and cultural issues. Lack of privacy may negatively affect the rate of acceptance and adoption of TMSP systems. Thus, it is important for us to measure how the privacy issues will affect the acceptance of TMSP systems in Saudi Arabia. Thus, I propose hypothesis 10: privacy issues have a negative effect on the usage intention of TMSP systems.

Cultural Values

Culture studies has stemmed from different disciplines such as anthropology and sociology, and it has been used by many researchers to explain why people behave in different ways (Davison & Martinsons, 2003). Previous studies of technology acceptance and adoption have shown culture is a key factor in the acceptance of new technology (Leidner & Kayworth, 2006). In this research, I study the technology acceptance of Saudi citizens. Saudi Arabia has its own unique culture (see chapter 2), and the people of that country have their own cultural values. Saudi Arabia is mostly a tribal, religious society. Individual and group interviews findings have shown that these cultural values and religions have an effect on the technology acceptance and usage intention of TMSP systems. Hence, I propose hypothesis 11: cultural values will affect the usage intention of TMSP systems.

4.7 **Summary**

This chapter reported on the phase one qualitative study results. The proposed research aims to identify the motivation factors that affect the public and citizens to accept and adopt TMSP systems and build a TMSP adoption model. The problem statement and research objectives were discussed in chapter 1of this dissertation. The first phase consisted of two separate sub studies with two different data collection techniques. The findings of the first phase have accomplished two research tasks:

1. Constructing the adoption model that will be empirically tested in the second phase of research and

2. Informing the design of the survey instrument that will be employed in the second quantitative part of this research.

The focus groups resulted in 60 themes, 42 (including gender) of which have been identified and classified into 11 model constructs. The rest of the themes did not contribute to model construct development. The individual interview results have confirmed the findings of the focus groups. The findings suggest adding gender to cultural values and emphasizing the impact of social and contextual factors rather than technical factors on usage intention. In the next chapter, the results of phase two, the quantitative study, will be reported.

Chapter 5: Validation of the TMSP Acceptance Model

This chapter reports on the quantitative results of the second phase of the research. A large scale survey has been used to test and validate the TMSP systems adoption model developed in the first phase of the research (chapter 4). The results are presented in six sections (1) Characteristics of Respondents; (2); Survey Responses; (3) Descriptive Statistics; (4) Structural Equation Modelling and hypotheses testing for all participants' data; (5) Structural Equation Modelling and hypotheses testing for population model (6) Structural Equation Modelling and hypotheses testing for User and Non-users of TMSP systems.

5.1 Characteristics of Respondents

Out of the 942 responses the survey received, Table 5.1 summarizes the characteristics of the 684 respondents whose survey responses met the full criteria for inclusion in the study. (Recall that our population sample was restricted to Saudi Citizens who regularly own and use a smartphone).Over half (389, 56.9%) were female, it representative as in the national population 52% of Saudis are female . They ranged in age from 18 to over 60 years. The most frequent age-group (293, 42.8%) was 18 to 25 years, in the national population 51% is under the age of 25. The majority of respondents were students (296, 43.3%) or government workers (220, 32.2%). Most of them were located in the middle (340, 49.7%) or Eastern (182, 26.6%) regions of Saudi Arabia. The majority of respondents (523, 76.5%) did not

have prior experience using reporting applications, and that was to be expected as only couple of incident reporting systems were available at the time of data collection.

Gender	Male	295	43.1%
	Female	389	56.9%
Age (Years)	18-25	293	42.8%
	26-31	109	15.9%
	32-40	164	24.0%
	41-50	69	10.1%
	51-60	44	6.4%
	> 60	5	0.7%
Occupation	Student	296	43.3%
	Government worker	220	32.2%
	Private sector worker	53	7.7%
	Unemployed	76	11.1%
	Retired	39	5.7%
Location	Middle	340	49.7%
	Eastern	182	26.6%
	Southern	11	1.6%
	Western	100	14.6%
	Northern	5	0.7%
	Abroad	46	6.7%
Used reporting Apps	Yes	161	23.5%
	No	523	76.5%

5-1 Frequency Distributions of the Characteristics of Respondents

5.2 Survey Responses

Table 5.2 records the responses of the 684 participants to the 77 items listed in Table 3.6 based on a 7-point rating scale (*1 = Strongly Agree, 2 = Agree; 3 = Sometimes Agree; 4 =Neutral; 5 = Sometimes disagree; 6 =Disagree, and 7 = Strongly Disagree*). The frequency distributions (counts and percentages) of many of the responses tended to be skewed, because the respondents generally tended to endorse the lower (agreement) ends the 7-point scales for most of the items. The

tendency of respondents to consistently agree to questionnaire items, known as "acquiescent response bias" is reported to be an aspect of the cultural communication style of Arabs (Smith, 2004). For example, the modes, corresponding to the highest frequencies of responses (highlighted in bold text in Table 5.2) were consistently located at a score of 1 = Strongly Agree for the items measuring Performance Expectancy, Facilitating Conditions, Privacy Issues, Usage Intentions, and Sense of Community. The most frequently endorsed strong agreements reported by over 60% of the respondents in order of magnitude were for "*E21: Seeing positive results of my report is very rewarding* (473, 69.2%); "FC01: *I will have a Smartphone to use reporting apps* (458, 67.0%); "SC06: *I care about what is happening in my country*" (449, 65.6%); "PE02: *Using reporting apps would enable me to report more quickly*" (447, 65.4%);"SC01: *Being a citizen of Saudi Arabia makes me feel good* (446, 65.2%); "E19 *I will use the reporting apps if my report solve the problem* (424, 62.0%); "FC03: *I can download reporting apps on my phone* (416, 60.8%); "E17: *Getting feedback is very important to me when I use reporting apps* (411, 60.1%).

The frequency distributions of the responses were not, however, all consistently in agreement with all of the items. The modes for the responses to the items measuring Social Influence were consistently at 3 = Neutral. The items measuring Trust, Participation Cost, Expectations, and Cultural Values elicited a wide range of responses from across the 7-point scale.

Survey Items	1. Strongly Agree	2. Agree	3. Sometimes Agree	4. Neutral	5. Sometimes disagree	6. Disagree	7. Strongly Disagree
PE01: I would find reporting apps useful in incident reporting.	405 (59.2%)	125 (18.3%)	126 (18.4%)	14 (2.0%)	7 (1.0%)	4 (0.6%)	3 (0.4%)
PE02: Using reporting apps would enable me to report more quickly.	447 (65.4%)	90 (13.2%)	92 (13.5%)	32 (4.7%)	12 (1.8%)	6 (0.9%)	4 (0.6%)
PE03: Using reporting apps would increase the effectiveness of my participation in the community.	400 (58.5%)	118 (17.3%)	121 (17.7%)	28 (4.1%)	10 (1.5%)	5 (0.7%)	2 (0.3%)
PE04: Using reporting apps to report an incident will result in taking care of this issue.	237 (32.6%)	189 (27.9%)	150 (21.9%)	72 (10.5%)	21 (3.1%)	9 (1.3%)	6 (0.9%)
EE01: My interaction with reporting apps would be clear.	276 (40.4%)	189 (27.6%)	152 (22.2%)	52 (7.6%)	11 (1.6%)	3 (0.4%)	1 (0.1%)
EE02: It would be easy for me to report using mobile reporting apps.	380 (55.6%)	130 (19.0%)	131 (19.2%)	26 (3.8%)	9 (1.3%)	6 (0.9%)	2 (0.3%)
EE03: I would find reporting apps easy to use.	346 (50.6%)	156 (22.8%)	122 (17.8%)	41 (6.0%)	9 (1.3%)	9 (1.3%)	1 (0.1%)
EE04:Learing how to send a report will be easy for me.	354 (51.8%)	157 (23.0%)	124 (18.1%)	30 (4.4%)	11 (1.6%)	5 (0.7%)	3 (0.4%)
SI01: People who influence my behavior think that I should use reporting apps.	132 (19.3%)	145 (21.2%)	141 (20.6%)	173 (25.3%)	55 (8.0%)	13 (1.9%)	25 (3.7%)
SI02: People who are important to me think that I should use reporting apps.	153 (22.4%)	140 (20.5%)	145 (21.2%)	167 (24.4%)	47 (6.9%)	9 (1.3%)	23 (3.4%)
SI03: I will use mobile reporting apps because my	103 (15.1%)	107 (15.6%)	133 (19.4%)	172 (25.1%)	97 (14.2%)	22 (3.2%)	50 (7.3%)

friends are using them.							
FC01: I will have a Smartphone to use reporting apps.	458 (67.0%)	69 (10.1%)	133 (19.4%)	14 (2.0%)	7 (1.0%)	1 (0.1%)	2 (0.3%)
FC02: I will have the knowledge necessary to use the mobile reporting apps.	256 (37.4%)	118 (17.3%)	145 (21.2%)	70 (10.2%)	70 (10.2%)	11 (1.6%)	14 (2.0%)
FC03: I can download reporting apps on my phone.	416 (60.8%)	88 (12.9%)	130 (19%)	28 (4.1%)	15 (2.2%)	3 (0.4%)	4 (0.6%)
UI01: I intend to use reporting apps in the near future.	244 (35.7%)	130 (19.0%)	169 (24.7%)	95 (13.9%)	24 (3.5%)	16 (2.3%)	6 (0.9%)
UI02: I predict I would use reporting apps to report in the near future.	254 (37.1%)	130 (19.0%)	196 (28.7%)	70 (10.2%)	21 (3.1%)	7 (1.0%)	6 (0.9%)
UI03: I plan to use reporting apps in the near future.	242 (35.4%)	123 (18.0%)	158 (23.1%)	104 (15.2%)	33 (4.8%)	13 (1.9%)	11 (1.6%)
PI01: I am concerned that the information I will disclose when using reporting apps would be misused.	143 (20.9%)	112 (16.4%)	125 (18.3%)	104 (15.2%)	124 (18.1%)	24 (3.5%)	52 (7.6%)
PI02: Reporting anonymously is an important feature of reporting apps.	272 (39.8%)	94 (13.7%)	119 (17.4%)	89 (13.0%)	55 (8.0%)	20 (2.9%)	35 (5.1%)
PI03: I am concerned about providing personal information when I use reporting apps.	154 (22.5%)	112 (16.4%)	109 (15.9%)	90 (13.2%)	118 (17.3%)	26 (3.8%)	75 (11.0%)
PI04: I am concerned that my private information would not be protected by law when I use reporting apps.	295 (43.1%)	92 (13.5%)	122 (17.8%)	76 (11.1%)	52 (7.6%)	15 (2.2%)	32 (4.6%)
T01: Mobile reporting apps are	145 (21.2%)	151 (22.1%)	141 (20.6%)	198 (28.9%)	27 (3.9%)	10 (1.5%)	12 (1.8%)

trustworthy.

Item							
T02: I trust that government agency will be transparent.	142 (20.8%)	143 (20.9%)	158 (23.1%)	150 (21.9%)	50 (7.3%)	23 (2.6%)	18 (2.6%)
T03: I think government agency will accept criticism.	105 (15.4%)	109 (15.9%)	149 (21.8%)	170 (24.9%)	82 (12.0%)	30 (4.4%)	39 (5.7%)
PC01: I will use reporting apps regardless of the cost.	102 (14.9%)	105 (15.4%)	115 (16.8%)	133 (19.4%)	165 (24.1%)	23 (3.4%)	41 (6.0%)
PC02: I will use reporting apps only if they are free.	234 (34.2%)	103 (15.1%)	143 (20.9%)	94 (13.7%)	69 (10.1%)	15 (2.2%)	26 (3.8%)
PC03: I think reporting apps will waste my time.	41 (6.0%)	55 (8.0%)	59 (8.6%)	94 (13.7%)	230 (33.6%)	49 (7.2%)	156 (22.8%)
PC04: Using reporting apps worth my time.	347 (50.7%)	115 (16.8%)	148 (21.6%)	50 (7.3%)	16 (2.3%)	4 (0.6%)	4 (0.6%)
HM01: Using reporting application is fun.	106 (15.5%)	121 (17.7%)	144 (21.1%)	233 (34.1%)	55 (8.0%)	9 (1.3%)	16 (2.3%)
HM02: Using reporting apps is boring.	39 (5.7%)	44 (6.4%)	50 (7.3%)	217 (31.7%)	207 (30.3%)	35 (5.1%)	92 (13.5%)
HM03: Using reporting apps is entertaining.	50 (7.3%)	78 (11.4%)	99 (14.5%)	278 (40.6%)	120 (17.5%)	16 (2.3%)	43 (6.3%)
E01: I predict if I use reporting apps then I will receive a reward.	63 (9.2%)	57 (8.3%)	65 (9.5%)	141 (20.6%)	210 (30.7%)	22 (3.2%)	126(18.4%)
E02: I predict my using of reporting apps will be appreciated by government.	144 (21.1%)	106 (15.5%)	173 (25.3%)	133 (19.4%)	78 (11.4%)	19 (2.8%)	31 (4.5%)
E03: I feel good when others appreciate my contribution to the community via reporting apps.	243 (35.5%)	120 (17.5%)	184 (26.9%)	93 (13.6%)	25 (3.7%)	8 (1.2%)	11 (1.6%)
E04: Getting recognition from a government will affect my choice to use reporting apps.	246 (36.0%)	105 (15.4%)	157 (23.0%)	97 (14.2%)	44 (6.4%)	8 (1.2%)	27 (3.9%)

E05: I value what others think of me than any other participation reward.	288 (42.1%)	109 (15.9%)	151 (22.1%)	77 (11.3%)	39 (5.7%)	7 (1.0%)	13 (1.9%)
E06: I feel good when I am recognized for being a good citizen.	344 (50.3%)	91 (13.3%)	146 (21.3%)	61 (8.9%)	21 (3.1%)	8 (1.2%)	13 (1.9%)
E07: I will use reporting apps only when government pays me to use them.	48 (7.0%)	47 (6.9%)	43 (6.3%)	73 (10.7%)	195 (28.5%)	26 (3.8%)	252 (36.8%)
E08: I will use reporting apps even when I do not receive monetary reward.	340 (49.7%)	94 (13.7%)	150 (21.9%)	66 (9.6%)	16 (2.3%)	8 (1.2%)	10 (1.5%)
E09: I value money more than any other participation awards.	44 (6.4%)	45 (6.6%)	47 (6.9%)	99 (14.5%)	172 (25.1%)	28 (4.1%)	249 (36.4%)
E10: I will use reporting apps if the government responds to my reports.	404 (59.1%)	93 (13.6%)	123 (18.0%)	37 (5.4%)	11 (1.6%)	7 (1.0%)	9 (1.3%)
E11: I predict that government agencies wil respond to my reports.	150 (21.9%)	138 (20.2%)	190 (27.8%)	140 (20.5%)	34 (5.0%)	13 (1.9%)	19 (2.8%)
E12: I will use reporting apps when I am certain there will be positive outcome for my report.	293 (42.8%)	113 (16.5%)	145 (21.2%)	67 (9.8%)	35 (5.1%)	8 (1.2%)	23 (3.4%)
E13: I believe reports apps will benefit the whole community.	393 (57.5%)	111 (16.2%)	121 (17.7%)	43 (6.3%)	9 (1.3%)	3 (0.4%)	4 (0.6%)
E14: I consider using reporting application as a form of giving charity.	329 (48.1%)	115 (16.8%)	136 (19.9%)	70 (10.2%)	15 (2.2%)	4 (0.6%)	15 (2.2%)
E15: Reporting violators is a form of giving back to my community.	351 (51.3%)	123 (18.0%)	139 (20.3%)	49 (7.2%)	10 (1.5%)	3 (0.4%)	9 (1.3%)
E16: Tracking my reports is	403 (58.9%)	94 (13.7%)	121 (17.7%)	49 (7.2%)	10 (1.5%)	4 (0.6%)	3 (0.4%)

very important feature to me when I use reporting apps.							
E17: Getting feedback is very important to me when I use reporting apps.	411 (60.1%)	98 (14.3%)	116 (17.0%)	40 (5.8%)	10 (1.5%)	6 (0.9%)	3 (0.4%)
E18: If I do not know what happened to my report then I will not use the reporting app again.	222 (32.5%)	103 (15.1%)	170 (24.9%)	96 (14.0%)	51 (7.5%)	15 (2.2%)	27 (3.9%)
E19 I will use the reporting apps if my report solve the problem.	424 (62.0%)	108 (15.8%)	109 (15.9%)	29 (4.2%)	4 (0.6%)	5 (0.7%)	5 (0.7%)
E20: Using reporting apps will make solving community problems easier.	387 (56.6%)	127 (18.6%)	112 (16.4%)	46 (6.7%)	5 (0.7%)	4 (0.6%)	3 (0.4%)
E21: Seeing positive results of my report is very rewarding.	473 (69.2%)	69 (10.1%)	108 (15.8%)	21 (3.1%)	8 (1.2%)	3 (0.4%)	2 (0.3%)
E22: I will use reporting application because I am frustrated about violations.	296 (43.3%)	109 (15.9%)	140 (20.5%)	91 (13.3%)	25 (3.7%)	10 (1.5%)	13 (1.9%)
SC01: Being a citizen of Saudi Arabia makes me feel good.	446 (65.2%)	53 (7.7%)	108 (15.8%)	41 (6.0%)	17 (2.5%)	7 (1.0%)	12 (1.8%)
SC02: I think using the reporting apps will make me a better citizen.	381 (55.7%)	98 (14.3%)	132 (19.3%)	46 (6.7%)	16 (2.3%)	4 (0.6%)	7 (1.0%)
SC03: I believe that using reporting apps will enhance my feeling of belonging to my community.	357 (52.2%)	108 (15.8%)	127 (18.6%)	62 (9.1%)	16 (0.9%)	6 (0.9%)	8 (1.2%)
SC04: I believe using reporting apps will allow me to introduce positive change in my	398 (58.2%)	116 (17.0%)	123 (18.0%)	33 (4.8%)	8 (1.2%)	1 (0.1%)	5 (0.7%)

community.							
SC05: Reporting apps will allow me to have positive influence on my community.	390 (57.0%)	109 (15.9%)	128 (18.7%)	39 (5.7%)	10 (1.5%)	1 (0.1%)	7 (1.0%)
SC06: I care about what is happening in my country.	449 (65.6%)	83 (12.1%)	114 (16.7%)	24 (3.5%)	5 (0.7%)	5 (0.7%)	4 (0.6%)
SC07: Reporting apps will make the government successful in meeting the needs of citizens.	403 (58.9%)	109 (15.9%)	116 (17.0%)	40 (5.8%)	6 (0.9%)	5 (0.7%)	5 (0.7%)
SC08: I think using reporting apps will help me in getting what I need.	293 (42.8%)	108 (15.8%)	139 (20.3%)	91 (13.3%)	23 (3.4%)	8 (1.2%)	22 (3.2%)
SC09: I feel satisfied when the government listens to my reports.	504 (73.7%)	62 (9.1%)	86 (12.6%)	22 (3.2%)	3 (0.4%)	4 (0.6%)	3 (0.4%)
CV01: I believe government agencies will ignore my report.	65 (9.5%)	83 (12.1%)	98 (14.3%)	231 (33.8%)	123 (18.0%)	36 (5.3%)	48 (7.0%)
CV02: Using reporting apps will result in no solution.	68 (9.9%)	79 (11.5%)	70 (10.2%)	206 (30.1%)	154 (22.5%)	411 (6.0%)	66 (9.6%)
CV03: I think using reporting apps will help in changing us into community.	353 (51.6%)	119 (17.4%)	139 (20.3%)	53 (7.7%)	8 (1.2%)	8 (1.2%)	4 (0.6%)
CV04: I will use reporting apps to report a problem or violation even when it caused or relevant to someone knows.	192 (28.1%)	121 (17.7%)	140 (20.5%)	176 (25.7%)	33 (4.8%)	7 (1.0%)	15 (2.2%)
CV05: I will use reporting apps to report violators regardless of their identity or their relationship to me.	216 (31.6%)	108 (15.8%)	136 (19.9%)	171 (25.0%)	35 (5.1%)	7 (1.0%)	11 (1.6%)
CV06: I will report my friends	140 (20.5%)	93 (13.6%)	120 (17.5%)	229 (33.5%)	62 (9.1%)	13 (1.9%)	27 (3.9%)

and family members if they violate the law.							
CV07: Using reporting apps does not contradict my religious beliefs.	371 (54.2%)	92 (13.5%)	117 (17.1%)	63 (9.2%)	24 (3.5%)	4 (0.6%)	13 (1.9%)
CV08: I believe using reporting apps is a good deed.	327 (47.8%)	122 (17.8%)	120 (17.5%)	91 (13.3%)	17 (2.5%)	3 (0.4%)	4 (0.6%)
CV09: Covering violators' mistakes and forgiving them is better than using reporting apps to report them.	66 (9.6%)	38 (5.6%)	54 (7.9%)	108 (15.8%)	161 (23.5%)	44 (6.4%)	213 (31.1%)
CV10: Women will use the reporting apps more than men.	138 (20.2%)	92 (13.5%)	96 (14.0%)	228 (33.3%)	79 (11.5%)	22 (3.2%)	29 (4.2%)
CV11: Saudi women and men will use reporting apps for the same purpose.	202 (29.5%)	128 (18.7%)	151 (22.1%)	145 (21.2%)	30 (4.4%)	14 (2.0%)	14 (2.0%)
CV12: Men will use reporting apps more than women.	110 (16.1%)	89 (13.0%)	116 (17.0%)	239 (34.9%)	76 (11.1%)	26 (3.8%)	28 (4.1%)
CV13: Women and men will equally use the reporting apps.	92 (13.5%)	82 (12.0%)	116 (17.0%)	213 (31.1%)	113 (16.5%)	36 (5.3%)	32 (4.7%)
CV14: Government will respond to men reports better than women reports.	60 (8.8%)	79 (11.5%)	72 (10.5%)	216 (31.6%)	123 (18.0%)	30 (4.4%)	104 (15.2%
CV15: I feel Reporting apps will harm others.	50 (7.3%)	44 (6.4%)	58 (8.5%)	115 (16.8%)	172 (25.1%)	39 (5.7%)	206 (30.1%)

5-2frequency Distributions of Survey Responses

5.3   Descriptive Analysis of Latent Variables

The twelve latent variables were operationalized by averaging the clusters of 7-point item scores that constituted each of their indicators. Visual examination of the histograms of the twelve latent variables illustrated in Figure 5.1 reveals that the frequency distributions of the 7-point responses generally deviated from normal bell-shaped curves. Positively skewed distributions, with conspicuous modes on the left hand side, reflecting a high frequency of endorsement of 1 = strong agreement or 2 = agreement with the items, were found for Performance Expectancy, Effort Expectancy, Facilitating Conditions, Usage Intention, Privacy Issues, Expectations, and Sense of Community.
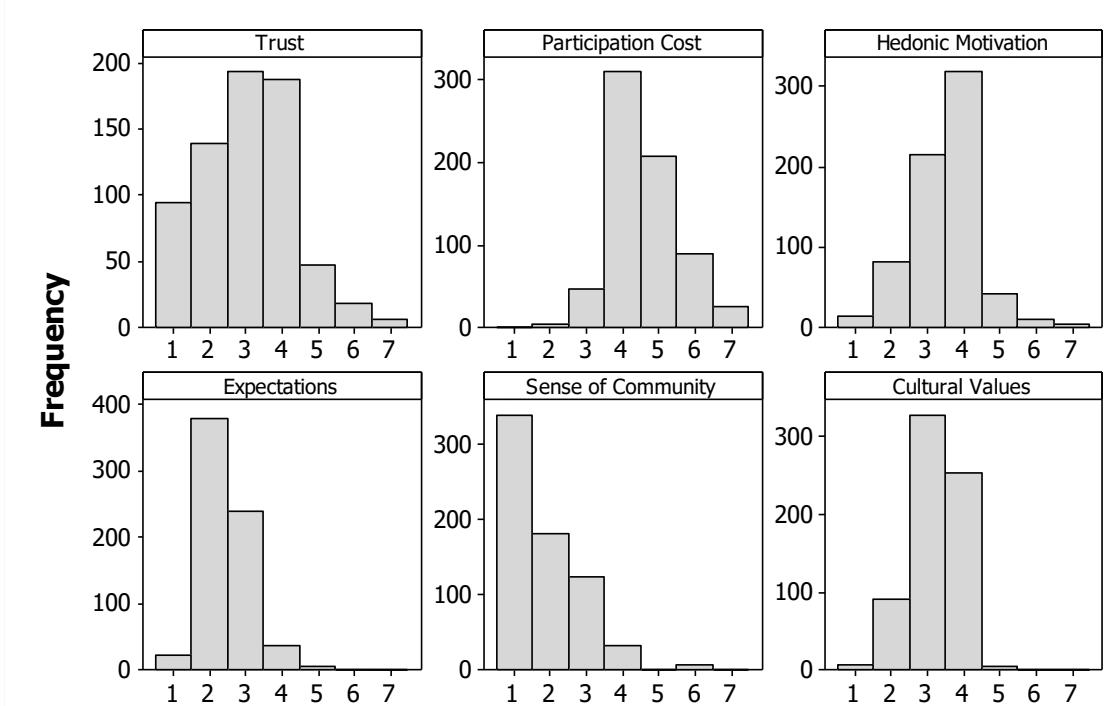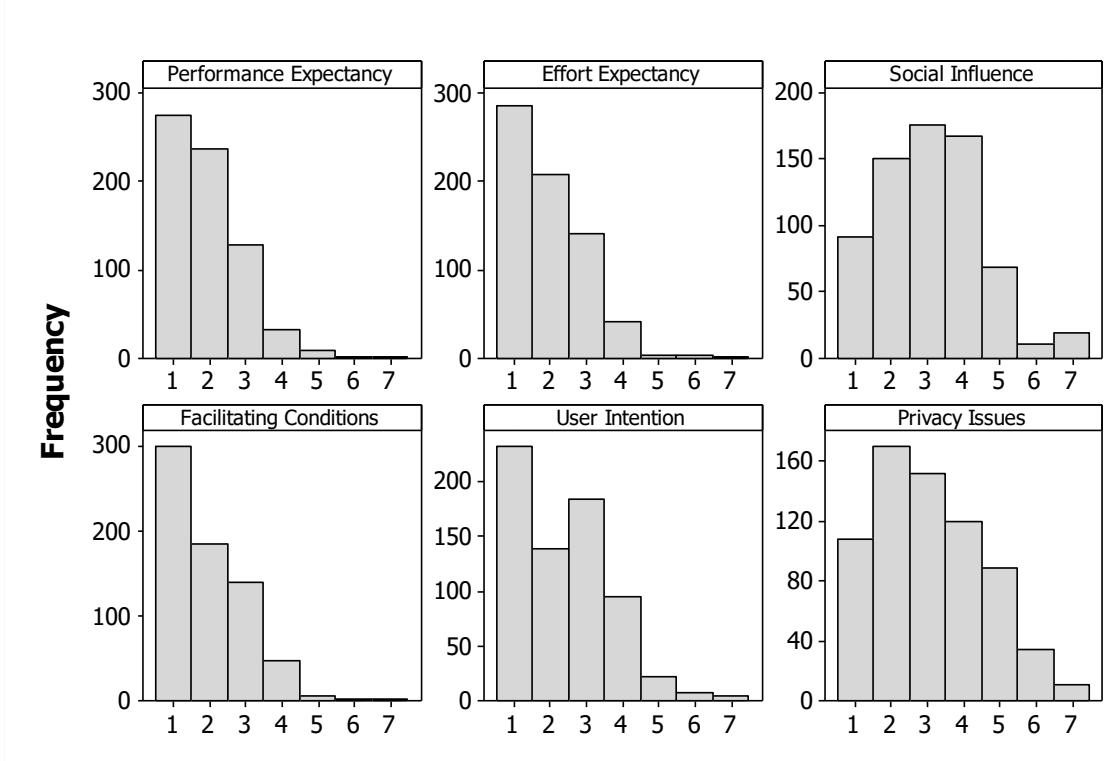
FIGURE 5.1 Frequency Distribution Histograms of Twelve Latent Variables

The tests for the normality of the twelve latent variables summarized in Table 5.3 confirmed that they were not normally distributed. Consistently strong deviations from normality were indicated by (a) $p < 0.01$ for the Kolmogorov-Smirnov(K-S) normality test statistic; (b) mean scores that deviated from the median scores; and (c) high values of the skewness statistics (where zero indicates normality, negative statistics indicate negatively skewed distributions, and positive statistics indicate positively skewed distributions). Because the latent variables deviated strongly from normality, parametric statistics, which assumed normally distributions, were not appropriate to analyze the data. The median scores were used to summarize the responses because the median is a less biased measure of central tendency than the mean when frequency distributions deviate from normality (Field, 2013).

The median scores are presented here just to summarize the questionnaire responses. They were not used to predict Usage Intention. Low median scores, below 3.0 reflecting higher levels of agreement were, in order of magnitude, awarded for Effort Expectancy (1.90); Performance Expectancy (1.86); Sense of Community (1.85); Facilitating Conditions (1.97); Expectations (2.43); Usage Intention (2.40) and Privacy Issues(2.98). Higher mean scores, reflecting lower levels of agreement, were for Social Influence (3.13); Trust (3.06); Cultural Values (3.24); Hedonic Motivation (3.51). The highest level of median disagreement was for Participation Cost (4.48).

Latent Variable	Indicators	Mean	SD	Median	Skew	K-S test statistic	p
Effort Expectancy	EE01 to EE04	1.90	0.95	1.50	1.226	4.488	<.001*
Performance Expectancy	PE01 to PE05	1.86	0.92	1.50	1.570	4.586	<.001*
Sense of Community	SC01 to SC09	1.85	0.96	1.56	1.512	4.902	<.001*
Facilitating Conditions	FC01 to FC03	1.97	1.02	1.67	1.131	4.492	<.001*
Expectations	E01 to E22	2.43	0.68	2.32	0.971	2.395	<.001*
Usage Intention	UI01 to UI03	2.40	1.27	2.33	0.701	4.209	<.001*
Privacy Issues	PI01 to PI04	2.98	1.46	2.75	0.500	2.682	<.001*
Social Influence	SI01 to SI03	3.13	1.39	3.00	0.489	1.888	.002*
Trust	T01 to T03	3.06	1.27	3.00	0.274	1.806	.003*
Cultural Values	CV01 to CV15	3.24	0.63	3.33	-0.481	1.833	.002*
Hedonic Motivation	HM1 to HM3	3.51	0.93	3.67	0.017	3.765	<.001*
Participation Cost	PC01 to PC04	4.48	0.89	4.25	0.487	3.379	<.001*

Note: * Significant deviation from normality (p < .01)

5-3test For Normality of Latent Variables (N = 684)

Gender Comparison

Table 5.4 presents the results of the Mann-Whitney U test to compare the median scores for each of the 12 latent variables between the male and female participants. No significant differences (p > 0.05) were found between the median scores with respect to gender. The median score for Usage Intention was exactly the same for both males and females. Consequently, it could be argued that it was not justified to test the hypotheses separately for males and females because, from a purely statistical perspective, both groups appeared to be members of a single population.

Latent Variable	Median		Mann-Whitney U statistic	P
	Male n = 295	Female n = 389		
Cultural Values	3.32	3.32	55206.50	0.396
Effort Expectancy	1.66	1.63	54139.50	0.199
Expectations	2.34	2.30	54597.50	0.277
Facilitating Conditions	1.66	1.73	56214.50	0.643
Hedonic Motivation	3.57	3.68	55631.50	0.489
Participation Cost	4.27	4.35	54697.00	0.291
Performance Expectancy	1.64	1.56	54409.00	0.240
Privacy Issues	2.98	2.64	52961.50	0.084
Sense of Community	1.58	1.47	54102.00	0.196
Social Influence	2.97	3.14	54751.50	0.303
Trust	3.12	3.03	54034.50	0.190
Usage Intention	2.27	2.27	57069.50	0.903

Note: * Significant difference (p < .05)

5-4 Comparison Of Median Scores for Latent Variables Between Male and Female Respondents

TMSP system Usage comparison

Table 5.5 presents the results of Mann-Whitney U test to compare the median scores for each of the 12 latent variables between the participants who answered "Yes" or "No" to the question "Have you ever used reporting apps?" Significant differences (p < 0.05) were found between the median scores for 9 of the 12 variables according to whether or not the respondents had previously used any type of TMSP system. Because the majority of the median scores for Usage Intention were significantly different between the two groups, it was justified to test the hypotheses separately for each group, because from a statistical perspective, the two groups represented two different populations.

Latent Variable	Median		Mann-Whitney U statistic	p
	Non-Users n = 523	Users n = 161		
Cultural Values	3.04	3.39	31961.00	<0.001*
Effort Expectancy	1.38	1.77	36211.50	0.006*
Expectations	2.12	2.39	33566.00	<0.001*
Facilitating Conditions	1.22	1.92	26859.00	<0.001*
Hedonic Motivation	3.18	3.74	28506.50	<.001*
Participation Cost	4.49	4.27	36486.00	0.010*
Performance Expectancy	1.46	1.64	38265.00	0.077
Privacy Issues	3.23	2.65	35441.50	0.002*
Sense of Community	1.42	1.55	38653.00	0.112
Social Influence	2.85	3.14	38635.00	0.113
Trust	2.78	3.13	37019.50	0.020*
Usage Intention	1.55	2.48	32023.00	<0.001*

Note: * Significant difference (p < .05)

5-5 Comparison of Median Scores for Latent Variables Users and Non-Users Of TMSP Systems

5.4 Multicollinarity and Correlation Results

The matrix of bivariate (Spearman's rank) correlation coefficients in Table 5.6 indicated multiple significant positive correlations between the eleven predictor variables. The correlation matrix also indicates that Usage Intention was significantly correlated with the eleven latent variables, providing preliminary evidence that is consistent with the eleven hypotheses. Bivariate correlation analysis, however, is misleading and does not provide definitive results to test the hypotheses because, unlike PLS-SEM (which was used to analyze the survey data as detailed in Chapter 3); it does not take into account the spurious or partial correlations that arise when the root cause of the correlation between two variables is their joint correlation witha third variable.

The advantage of using PLS-SEM over bivariate correlation analysis is that spurious correlations are partialled out (Hair et al., 2014). Partialling out is allowing for controlling the effect of a third variable on a bivariate correlation. After partialling out, the contribution of the third variable (specifically the variance that it shares with the other two variables) is excluded. As a result, the bivariate correlation is either reduced in magnitude or eliminated to zero. Partialling out implies that the variables that are significantly correlated in Table 5.6 may not also be significantly correlated when the same data are analyzed using PLS-SEM.

	Cultural Values	Effort Expectancy	Expectations	Facilitating Conditions	Hedonic Motivation	Participation Cost	Performance Expectancy	Privacy Issues	Sense of Community	Social Influence	Trust	Usage Intention
Cultural Values	1											
Effort Expectancy	.378**	1										
Expectations	.551**	.519**	1									
Facilitating Conditions	.329**	.585**	.473**	1								
Hedonic Motivation	.271**	.259**	.286**	.330**	1							
Participation Cost	-.447**	-.240**	-.363**	-.251**	-.281**	1						
Performance Expectancy	.317**	.631**	.501**	.443**	.217**	-.259**	1					
Privacy Issues	-.123**	.085*	.072	-.009	-.083*	.147**	.112**	1				
Sense of Community	.478**	.483**	.707**	.396**	.281**	-.336**	.503**	.111**	1			
Social Influence	.090*	.331**	.184**	.238**	.189**	-.180**	.305**	.148**	.261**	1		
Trust	.220**	.357**	.349**	.285**	.257**	-.228**	.426**	.080*	.396**	.341**	1	.
Usage Intention	.356**	.501**	.467**	.532**	.384**	-.332**	.471**	.110**	.489**	.443**	.425**	1

Note: Significant correlation ** $p < .01$; * $p < .05$

5-6 Bivariate Correlation Matrixes

The matrix of statistically significant correlation coefficients in Table 5.6 indicates that Multicollinarity (multiple correlations between the predictor variables) may be a problem which compromises the results of PLS-SEM. Table 5.7 lists the variance inflation factors (VIF) and tolerance levels computed by SPSS. Because the tolerance levels were consistently above 0.20 and the VIFs were consistently below 5.00, Multicollinarity was not too high, and therefore the elimination or merging of correlated latent variables was not considered to be necessary.

Latent Variable	Tolerance	VIF
Cultural Values	0.588	1.702
Effort Expectancy	0.449	2.225
Expectations	0.393	2.543
Facilitating Conditions	0.590	1.695
Hedonic Motivation	0.810	1.234
Participation Cost	0.727	1.375
Performance Expectancy	0.514	1.946
Privacy Issues	0.891	1.123
Sense of Community	0.438	2.284
Social Influence	0.792	1.263
Trust	0.721	1.387

5-7 Test For Multicollinearity

5.5   PLS-SEM: Population Model

Figure 5.2 presents the preliminary population model constructed using SmartPLS based on the 77 item scores provided by all (N = 684) respondents (see chapter 3 for detailed analysis plan using PLS). This model initially failed to satisfy the quality criteria(Hair et al., 2014), mainly because the factor loading coefficients for some indicators were very weak (< 0.4).This preliminary model was restructured by eliminating the indicators with very weak factor loading coefficients (< 0.4) which contributed little to the variance in their corresponding latent variables.   The restructured model excluding the following 11 indictors: E01R, E06, E09R, E18R, CV01R, CV09R, CV10R, CV12R, CV15R, PC02, PC03 with path coefficients < 0.4 is presented in Figure 5.3.   (R refers to the reversed scored items, as indicated in Table 3.6). The high number of reverse scored items that were excluded confirms that items that are negatively worded tend to compromise the results of factor analysis due to low factor loading coefficients (DiStefano & Motl, 2006). The factor loading for E12 was 0.396, which rounds up to 0.4 and therefore it was retained. The validity and quality criteria for the restructured model are presented in Table 5.8.
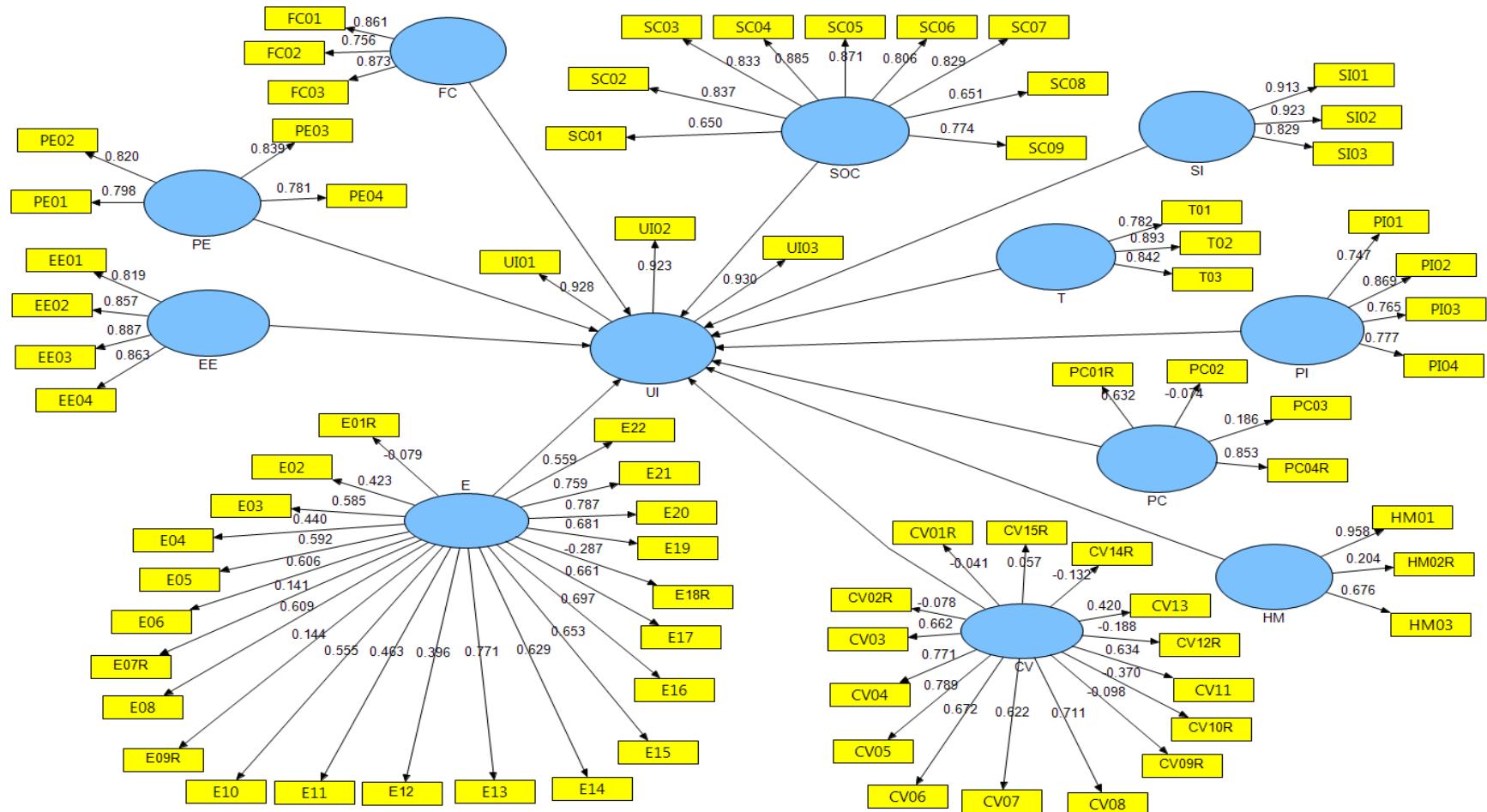
Figure 5.2 Preliminary Measurement Model Constructed From 77 Item Scores Provided By 684 Respondents

Note: CV = Cultural Values; EE = Effort Expectancy; E = Expectations; FC = Facilitating Conditions; HM =Hedonic Motivation; PC = Participation Cost; PE = Performance Expectancy; PI = Privacy Issues; SC = Sense of Community; SI = Social Influence; T = Trust; UI = Usage Intention

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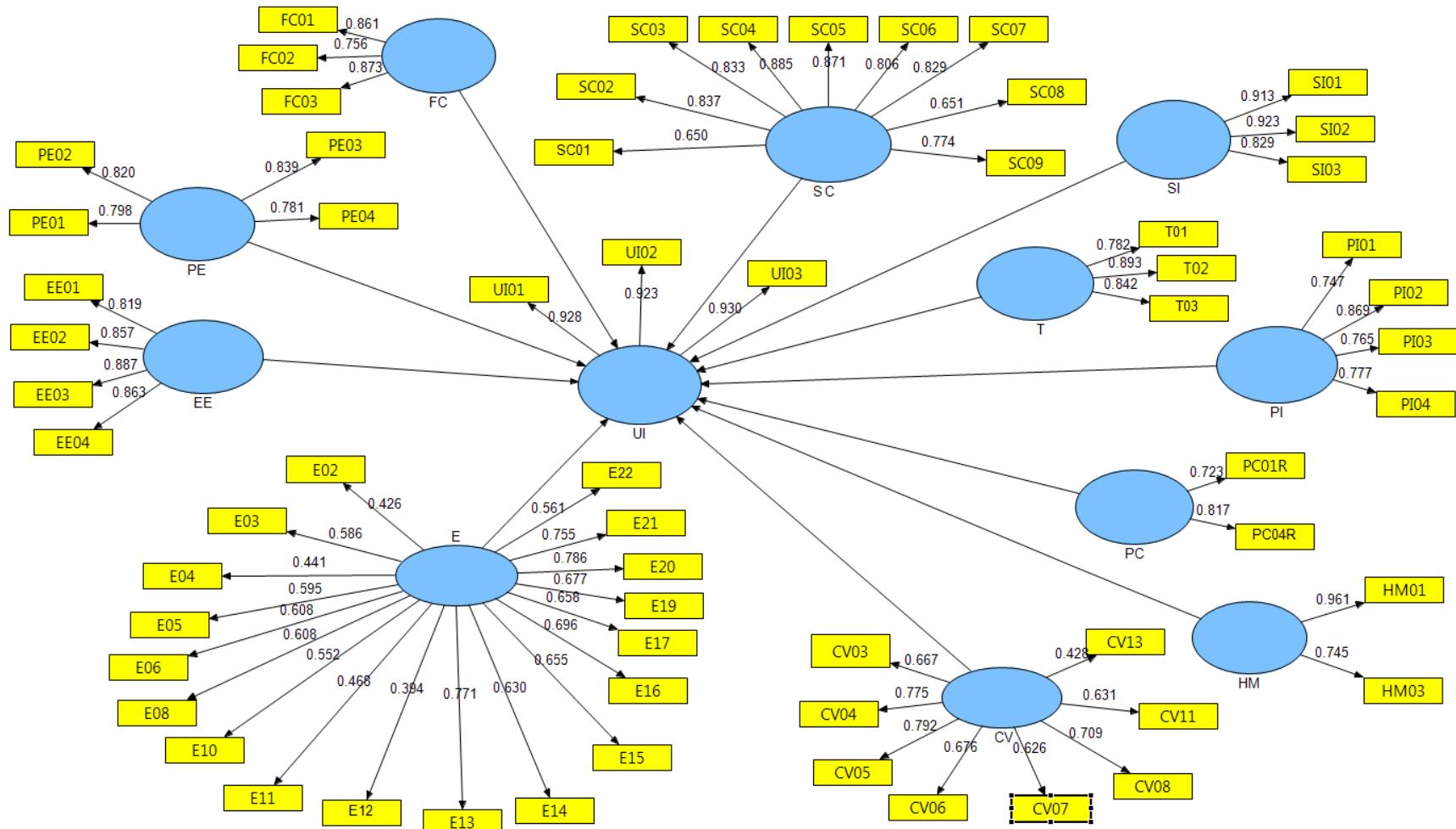
FIGURE 5.3 Restructured Measurement Model Constructed From 66 Item Scores Provided By 684 Respondents

Note: CV = Cultural Values; EE = Effort Expectancy; E = Expectations; FC = Facilitating Conditions; HM =Hedonic Motivation; PC = Participation Cost; PE = Performance Expectancy; PI = Privacy Issues; SC = Sense of Community; SI = Social Influence; T = Trust; UI = Usage Intention

Construct	AVE	Composite Reliability	R Square
Trust	0.706	0.878	
Cultural Values	0.450	0.865	
Expectations	0.377	0.913	
Effort Expectancy	0.734	0.917	
Facilitating conditions	0.692	0.870	
Hedonic Motivation	0.740	0.848	
Participation Cost	0.595	0.745	
Performance Expectancy	0.656	0.884	
Privacy Issues	0.626	0.869	
Social Influence	0.791	0.919	
Sense of Community	0.636	0.939	
Usage Intnention	0.859	0.948	**0.505**

5-8 Validity And Quality Criteria For Restructured Model In Figure 5.6

The average variance explained by the indicators for each latent variable (AVE) in the restructured model was high (0.595 to 0.859) reflecting the good convergent validity of ten of the latent variables. The only latent variables that did not meet the conventional threshold quality criteria (AVE >0.5) were Cultural Values (AVE = 0.450) and Expectations (AVE = 0.377). The internal consistency reliability of all of the latent variables was good (Composite Reliability = 0.745 to .948). A moderate proportion of the variance in Usage Intention was explained (R^2 = 0.505).

The cross loadings of the factor loading coefficients to test for discriminant validity of the restructured model are presented in Table 5.9. All of the factor loading coefficients that initially assigned to operationalize each of the twelve latent variables (see Table 3.6) were greater than their factor loading coefficients for alternative latent variables. Therefore there was no threat to the discriminate validity of the twelve latent variables.

Figure 5.4 presents the path diagram of the structural model with path coefficients (β) between the latent variables. The results of t-tests to indicate the significance of the path coefficients and test the stated hypotheses of this study are presented in Table 5.10.

Indicators	Latent Variables											
	T	CV	E	EE	FC	HM	PC	PE	PI	SI	SC	UI
CV03	.290	**.667**	.592	.464	.400	.205	-.358	.420	0.123	0.167	0.653	0.350
CV04	.311	**.775**	.383	.267	.230	.246	-.370	.236	0.113	0.262	0.401	0.331
CV05	.326	**.792**	.375	.269	.230	.278	-.367	.232	0.131	0.248	0.404	0.348
CV06	.345	**.676**	.265	.203	.130	.197	-.308	.166	0.135	0.253	0.287	0.278
CV07	.203	**.626**	.500	.354	.358	.197	-.294	.305	0.105	0.096	0.437	0.296
CV08	.322	**.709**	.597	.389	.364	.265	-.419	.384	0.051	0.202	0.615	0.325
CV11	.313	**.631**	.405	.315	.252	.274	-.286	.277	0.087	0.266	0.399	0.349
CV13	.250	**.428**	.205	.123	.079	.180	-.239	.148	0.147	0.209	0.180	0.198
E02	.448	.304	**.426**	.140	.177	.322	-.306	.239	0.106	0.227	0.263	0.236
E03	.332	.383	**.586**	.265	.308	.349	-.326	.279	0.105	0.240	0.366	0.304
E04	.164	.227	**.441**	.162	.175	.163	-.174	.163	0.193	0.030	0.269	0.164
E05	.306	.341	**.595**	.252	.210	.222	-.377	.271	0.132	0.203	0.395	0.308
E06	.302	.351	**.608**	.217	.235	.210	-.314	.224	0.167	0.135	0.461	0.226
E08	.242	.433	**.608**	.371	.337	.212	-.424	.284	0.067	0.196	0.487	0.375
E10	.074	.266	**.552**	.261	.291	.030	-.162	.217	0.124	0.007	0.372	0.195
E11	.620	.374	**.468**	.275	.277	.390	-.414	.391	0.083	0.312	0.370	0.404
E12	.025	.148	**.394**	.198	.213	.014	-.085	.125	0.120	-0.003	0.204	0.126
E13	.289	.504	**.771**	.445	.399	.212	-.460	.465	0.108	0.204	0.633	0.403
E14	.224	.469	**.630**	.369	.369	.160	-.383	.391	0.132	0.229	0.528	0.285
E15	.298	.482	**.655**	.367	.338	.189	-.387	.407	0.147	0.278	0.547	0.316
E16	.214	.405	**.696**	.408	.412	.168	-.320	.385	0.140	0.156	0.514	0.366
E17	.137	.389	**.658**	.365	.377	.090	-.282	.335	0.110	0.102	0.455	0.305
E19	.171	.361	**.677**	.353	.340	.069	-.267	.325	0.172	0.050	0.508	0.267
E20	.286	.526	**.786**	.489	.432	.205	-.428	.512	0.121	0.189	0.698	0.381
E21	.173	.433	**.755**	.436	.407	.119	-.344	.428	0.119	0.050	0.630	0.325
E22	.244	.343	**.561**	.342	.310	.196	-.357	.302	0.098	0.208	0.394	0.335
EE01	.368	.385	.436	**.819**	.434	.216	-.363	.542	0.112	0.344	0.422	0.416
EE02	.244	.389	.483	**.857**	.527	.273	-.339	.560	0.090	0.242	0.436	0.423
EE03	.348	.416	.460	**.887**	.557	.249	-.362	.545	0.087	0.292	0.421	0.454
EE04	.287	.378	.475	**.863**	.554	.196	-.356	.521	0.114	0.270	0.413	0.428

	T	CV	E	EE	FC	HM	PC	PE	PI	SI	SC	UI
FC01	.253	.366	.522	.565	**.861**	.256	-.369	.467	.083	.249	.420	.474
FC02	.237	.288	.312	.392	**.756**	.346	-.325	.256	-.060	.178	.270	.404
FC03	.244	.326	.457	.542	**.873**	.199	-.355	.434	.038	.187	.348	.462
HM01	.361	.379	.344	.312	.323	**.961**	-.384	.255	.024	.318	.283	.441
HM03	.207	.148	.141	.083	.188	**.745**	-.190	.098	.021	.136	.116	.182
PC01R	-.433	-.337	-.241	-.213	-.197	-.322	**.723**	-.207	-.154	-.406	-.263	-.362
PC04R	-.281	-.424	-.588	-.411	-.434	-.248	**.817**	-.442	-.091	-.196	-.508	-.434
PE01	.348	.304	.437	.503	.372	.176	-.337	**.798**	.100	.205	.410	.358
PE02	.291	.316	.425	.532	.390	.138	-.312	**.820**	.089	.227	.388	.375
PE03	.307	.354	.501	.558	.441	.194	-.391	**.839**	.087	.235	.450	.396
PE04	.450	.364	.410	.455	.320	.243	-.358	**.781**	.161	.313	.401	.398
PI01	.093	.103	.088	.021	-.008	.078	-.082	.049	**.747**	.138	.066	.065
PI02	.121	.145	.195	.146	.066	.011	-.152	.151	**.869**	.108	.134	.152
PI03	.033	.078	.060	.010	-.042	.018	-.050	.041	**.765**	.126	.037	.047
PI04	.013	.155	.188	.106	.010	-.001	-.148	.119	.777	.102	.125	.096
SC01	.307	.366	.459	.224	.202	.148	-.324	.262	.152	.187	**.650**	.299
SC02	.352	.564	.594	.373	.291	.254	-.415	.386	.075	.279	**.837**	.408
SC03	.368	.553	.603	.360	.312	.273	-.434	.395	.104	.229	**.833**	.389
SC04	.341	.567	.683	.445	.412	.220	-.511	.489	.119	.248	**.885**	.474
SC05	.340	.562	.638	.463	.354	.242	-.463	.470	.083	.233	**.871**	.437
SC06	.241	.526	.647	.464	.411	.145	-.394	.401	.136	.163	**.806**	.397
SC07	.336	.536	.623	.429	.350	.195	-.410	.443	.107	.202	**.829**	.387
SC08	.309	.449	.455	.301	.254	.228	-.280	.354	.050	.209	**.651**	.352
SC09	.230	.496	.721	.438	.394	.154	-.408	.418	.135	.104	.774	.358
SI01	.298	.285	.257	.337	.258	.287	-.312	.271	.101	**.913**	.242	.384
SI02	.314	.324	.308	.339	.247	.267	-.369	.309	.136	**.923**	.282	.417
SI03	.289	.232	.169	.212	.152	.233	-.321	.229	.138	**.829**	.166	.377
T01	**.782**	.402	.404	.363	.315	.305	-.396	.424	.089	.278	.366	.365
T02	**.893**	.353	.383	.298	.252	.286	-.382	.369	.080	.262	.335	.396

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T03	**.842**	.355	.302	.251	.164	.298	-.360	.287	.067	.319	.286	.319
UI01	.404	.432	.468	.461	.499	.397	-.508	.454	.112	.428	.454	**.928**
UI02	.402	.445	.493	.489	.509	.357	-.466	.462	.131	.391	.481	**.923**
UI03	.394	.426	.451	.447	.490	.376	-.467	.397	.127	.411	.434	**.930**

5-9 Cross Loadings Of The Latent Variables
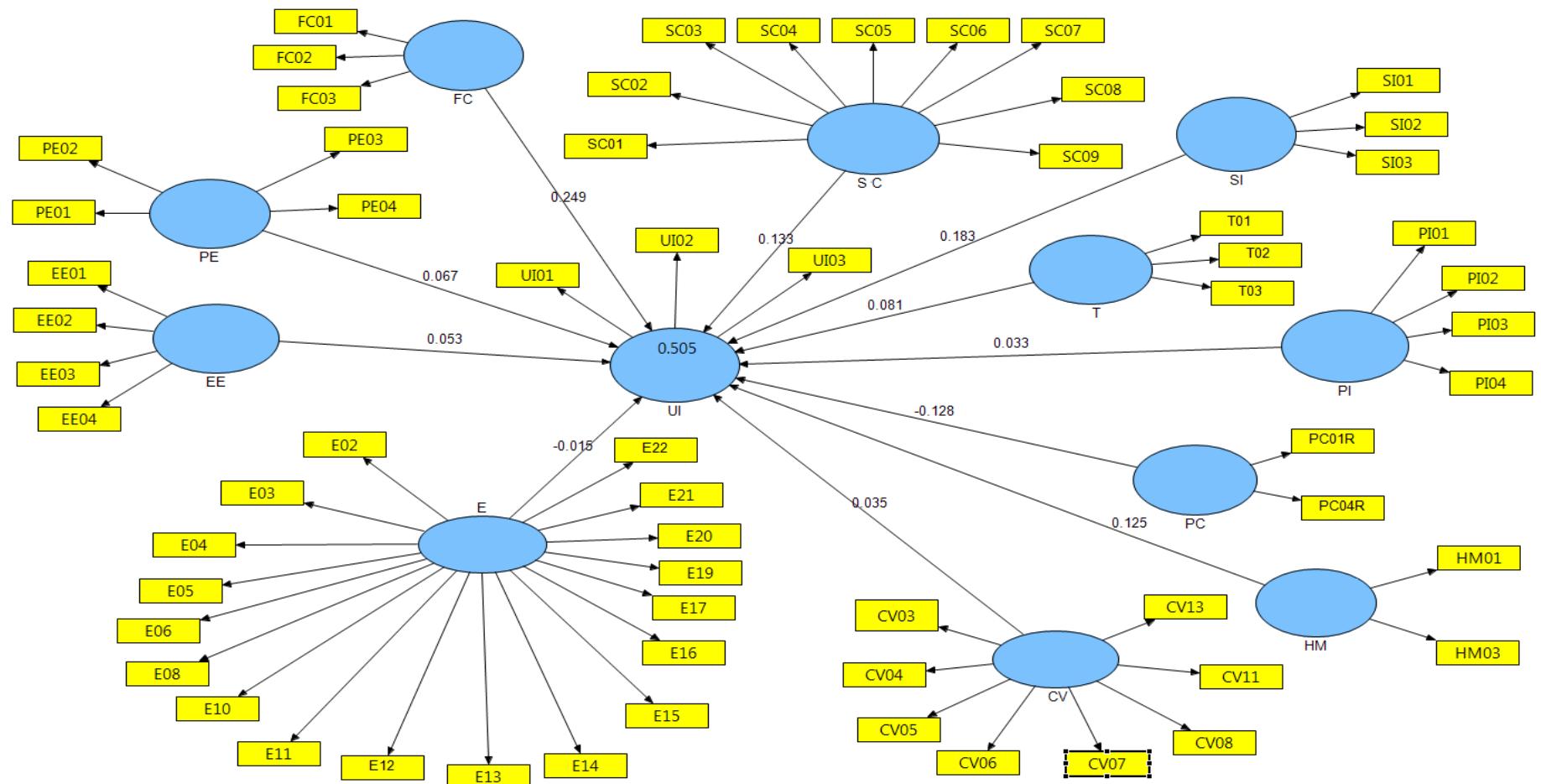
FIGURE 5.4 Restructured Structural Model Constructed From 66 Item Scores Provided By 684 Respondents Showing Value Of R²

Note: CV = Cultural Values; EE = Effort Expectancy; E = Expectations; FC = Facilitating Conditions; HM =Hedonic Motivation; PC = Participation Cost; PE = Performance Expectancy; PI = Privacy Issues; SC = Sense of Community; SI = Social Influence; T = Trust; UI = Usage Intent

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Hypothesis	Path coefficient β	t-test statistic	p-value
H1: Performance Expectancy has a positive effect on usage intention of TMSP systems.	0.067	1.703	.0089
H2: Effort Expectancy has a negative effect on usage intention of TMSP systems.	0.053	1.436	0.151
H3: Social Influence has a positive effect on usage intention of TMSP systems.	0.183	5.313	<.001*
H4: Facilitating Conditions has a positive effect on usage intention of TMSP systems.	0.249	5.664	<.001*
H5: Expectations have a positive effect on usage intention of TMSP systems.	-0.015	0.479	0.631
H6: Perceived Sense of Community has a positive effect on usage intention of TMSP systems.	0.133	2.460	0.014*
H7: Hedonic Motivation has a positive effect on usage intention of TMSP systems.	0.125	3.777	<.001*
H8: Trust has a positive effect on usage intention of TMSP systems	0.081	2.097	0.036*
H9: Cost of Participation has a negative effect on usage intention of TMSP systems.	-0.128	3.091	0.002*
H10: Privacy Issues has a negative effect on usage intention of TMSP systems.	0.033	1.418	0.156
H11: Cultural Values will affect the usage intention of TMSP systems.	0.035	1.077	.282

* Path coefficient is significantly different from zero ($p < .05$)

5-10 Testing of Hypotheses for Population Model

The statistical evidence at $p < 0.05$ supportedsix of the stated hypotheses: H3:Social Influence has a positive effect on usage intention of TMSP systems ($\beta = .183$; $t = 5.313$, $p < .001$); H4:Facilitating Conditions has a positive effect on usage intention of TMSP systems ($\beta = 0.249$, $t = 5.664$, $p < .001$);H6:Perceived Sense of Community has a positive effect on usage intention of TMSP systems ($\beta = .133$, $t = 2.460$, $p = 0.014$);H7:Hedonic Motivation has a positive effect on usage intention of TMSP systems ($\beta = .125$, $t = 3.777$;$p < .001$); H8:Trust has a positive effect on usage intention of TMSP systems ($\beta = 0.081$, $t = 2.097$, $p = 0.036$); and H9:Cost of Participation has a negative effect on usage intention of TMSP systems ($\beta = -.128$, $t = 3.09$, $p = 0.002$). There was insufficient evidence, however, at the .05 level to support the other five hypotheses ($\beta \approx 0$, $p > 0.05$). Performance Expectancy, Effort

Expectancy, Expectations, Privacy Issues, and Cultural Values appeared to have no statistically significant effects on usage intentions.

5.6   PLS-SEM: Multilevel (Non-User vs. User) Model

Figures 5.5 and 5.6 present the multilevel (non-user vs. user) model divided by N = 523 participants who answered "No" to the question "Have you ever used reporting apps?"and N = 161who answered "Yes" respectively. The measurement and structural models were constructed using only the 66 item scores with factor loading coefficients ≥ 0.4. The non-user model in Figure 5.5 explained a higher proportion of the variance in Usage Intention (R^2 = 0.513) than the user model (R2 = 0.508) in Figure 5.9.

The results of t-tests to test the stated hypotheses are presented in Table 5.11. The multilevel model revealed differences between the factors predicting the usage intentions of non-users and users of TMSP systems. The statistical evidence supported three of the stated hypotheses for both non-users and users as follows: H3: Social Influence has a positive effect on usage intention of TMSP systems by non-users (β = .180, t = 4.375, p < .001) and users (β = 0.171, t = 2.514, p = 0.012). H4: Facilitating Conditions has a positive effect on usage intention of TMSP systems by non-users (β = 0.252, t = 5.500, p <.001) and users (β = 0.230, t = 2.081, p = 0.037). H9: Cost of participation has a negative effect on usage intention of TMSP systems of non-users (β = -0.128. t = 2.736, p = 0.006) and users (β = -0.196. t = 2.560, p = 0.010).

Two of the hypotheses were supported only by the data provided by the non-users as follows: H6: Perceived Sense of Community has a positive effect on usage intention of TMSP systems ($\beta = 0.299$, $t = 3.438$, $p = 0.001$); and Trust has a positive effect on usage intention of TMSP systems ($\beta = 0.126$, $t = 2.923$; $p = 0.003$). One hypothesis was supported only by the data provided by the users: H7: Hedonic Motivation has a positive effect on usage intention of TMSP systems ($\beta = 0.250$, $t = 3.509$; $p =< 0.001$). There was insufficient statistical evidence, however, at the .05 level to support five of the hypotheses ($\beta \approx 0$, $p > 0.05$). The multilevel model indicated that Performance Expectancy, Effort Expectancy, Expectations, and Privacy Issues, and Cultural Values had no statistically significant effects on Usage Intention.

Hypothesis	Non-User			User		
	Path coefficient β	t-test statistic	p-value	Path coefficient β	t-test statistic	p-value
H1: Performance Expectancy has a positive effect on usage intention of TMSP systems.	0.071	1.665	0.096	-.00\006	0.073	0.942
H2: Effort Expectancy has a negative effect on usage intention of TMSP systems.	0.077	1.725	0.085	-0.046	0.520	0.603
H3: Social Influence has a positive effect on usage intention of TMSP systems.	0.180	4.375	<0.001*	0.171	2.514	0.012
H4: Facilitating Conditions has a positive effect on usage intention of TMSP systems.	0.252	5.500	<0.001*	0.230	2.081	0.037
H5: Expectations have a positive effect on usage intention of TMSP systems.	-0.041	1.059	0.290	0.056	0.570	0.569
H6: Perceived Sense of Community has a positive effect on usage intention of TMSP systems.	0.146	2.383	0.017*	0.101	1.065	0.287
H7: Hedonic Motivation has a positive effect on usage intention of TMSP systems.	0.069	1.010	0.313	0.250	3.509	0.000
H8: Trust has a positive effect on usage intention of TMSP systems	0.126	2.923	0.003*	-0.003	0.067	0.947
H9: Cost of Participation has a negative effect on usage intention of TMSP systems.	-0.128	2.736	0.006*	-0.196	2.560	0.010
H10: Privacy Issues has a negative effect on usage intention of TMSP systems.	0.061	1.895	0.058	-0.036	0.812	0.417
H11: Cultural Values will affect the usage intention of TMSP systems.	0.036	0.994	0.320	0.070	0.996	0.319

* Path coefficient is significantly different from zero ($p < .05$)

5-11 Testing of Hypotheses for Multilevel (User Vs. Non-User) Model
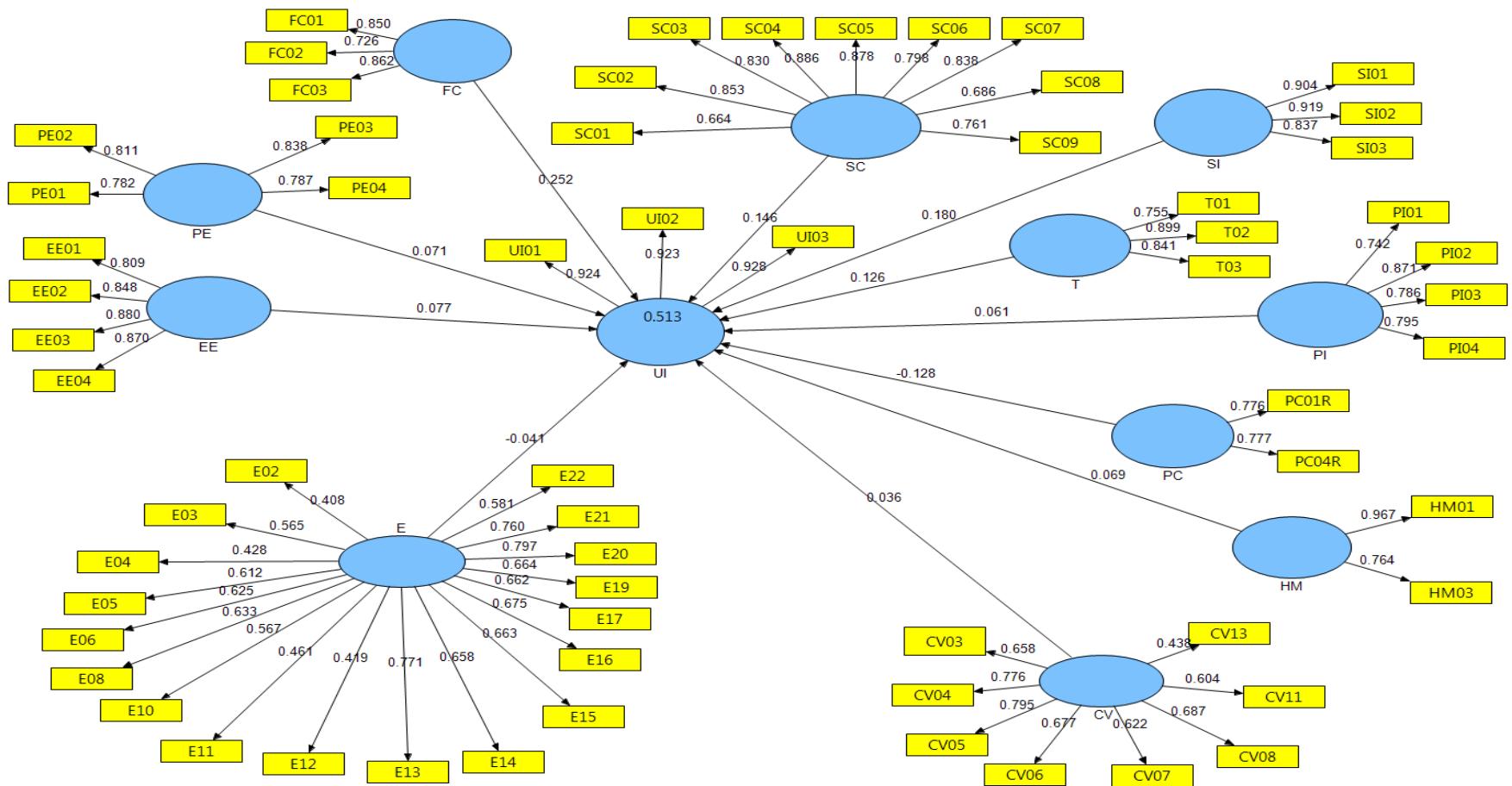
FIGURE 5.5 . Measurement and Structural Model Constructed From 66 Item Scores Provided By 523 Reporting App Non-Users

Note: CV = Cultural Values; EE = Effort Expectancy; E = Expectations; FC = Facilitating Conditions; HM =Hedonic Motivation; PC = Participation Cost; PE = Performance Expectancy; PI = Privacy Issues; SC = Sense of Community; SI = Social Influence; T = Trust; UI = Usage Intention
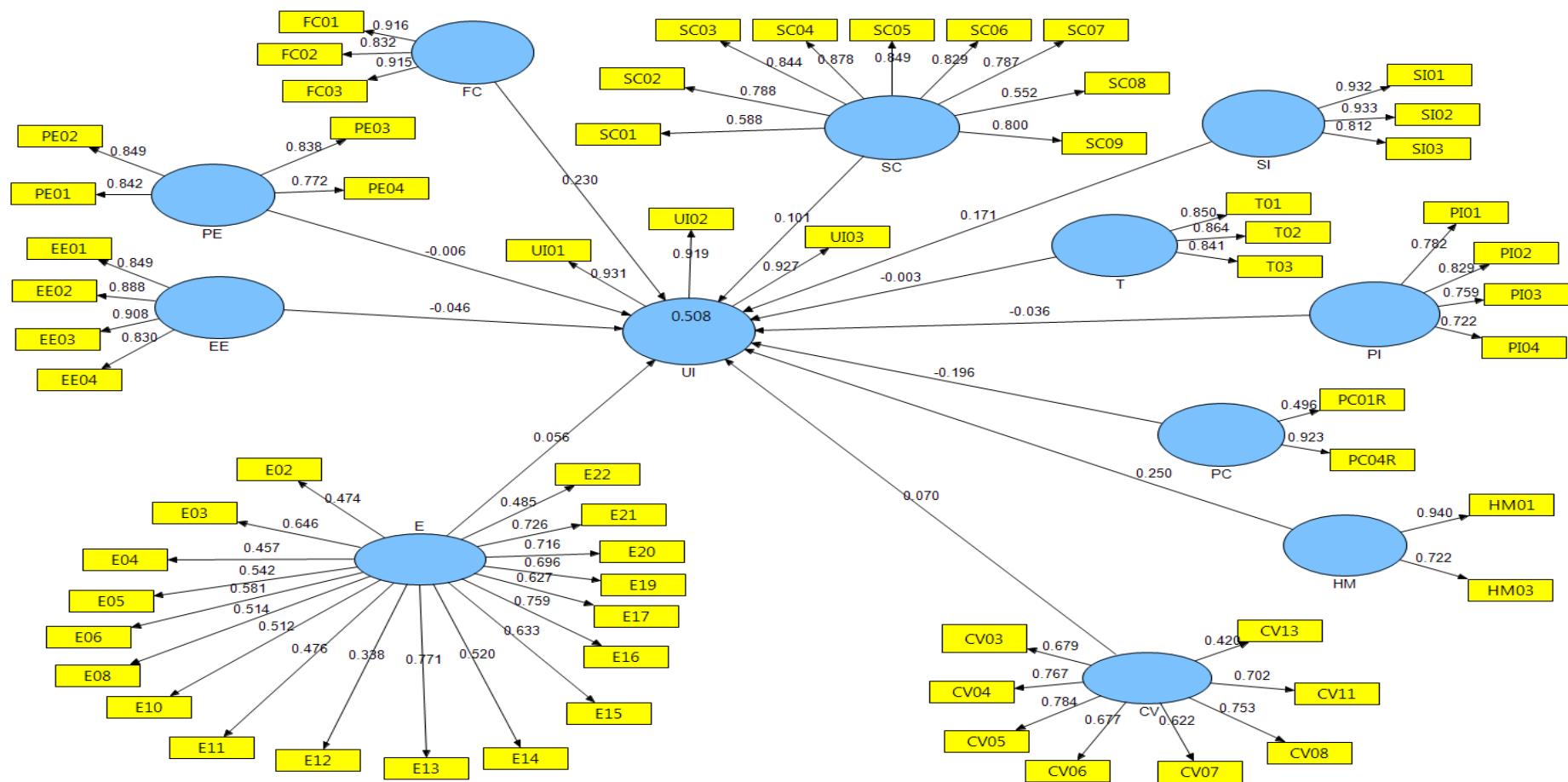
FIGURE 5.6 Measurement And Structural Model Constructed From 66 Item Scores Provided By 161 Reporting App Users

Note: CV = Cultural Values; EE = Effort Expectancy; E = Expectations; FC = Facilitating Conditions; HM =Hedonic Motivation; PC = Participation Cost; PE = Performance Expectancy; PI = Privacy Issues; SC = Sense of Community; SI = Social Influence; T = Trust; UI = Usage Intent

5.7 **Summary**

In this chapter, I reported on the validation process for TMSP acceptance model that was developed based on findings of the qualitative study reported in chapter 4. The model was tested by collecting data from Saudi citizens using a large scale survey. Out of the 942 responses the survey has received, 684 were complete and met the inclusion criteria.

SEM-PLS was used to test the part modeling between the 11 latent variables and Usage Intention. The finding of the PLS analysis suggests that the intention to use TMSP is a function of Social Influence, Facilitating Conditions, Hedonic Motivation, Sense of Community, Trust and Cost of Participation. Finally this chapter concluded with hypotheses testing for two group of participants (User Vs. non-Users) of TMSP systems.

Chapter 6: Discussion and Meta Inference

This study focused on the use of Technology Mediated Social Participation systems for incident reporting and the public good. It was designed to explore and identify factors affecting acceptance of these classes of systems among citizens of Saudi Arabia. It also developed a unified model predicting the factors influencing the intention to use such systems. This study was conducted specifically to answer the following research question: '***Why are people motivated (or not motivated) to take participatory actions to be more involved and engaged within their communities?***' This general research question has two sub-questions of interest:

RQ1: What are the key factors that influence the acceptance and use of TMSP systems?

RQ2: How are different motivational factors related to the intention of using the TMSP tools?

This chapter provides a discussion and interpretation of the results presented in the fourth and fifth chapters of this dissertation. The discussion of the results will be in the form of a meta-inference, an integrative view of findings from qualitative and quantitative strands of mixed-methods research. They are considered essential components of mixed-methods research (Tashakkori &Teddlie, 2008).

In order to provide a holistic overview of this study's results, this meta-inference will follow the approaches recommended by Venkatesh et al. (Venkatesh, Brown& Balla, 2013), namely bracketing and bridging. Bracketing is the process of incorporating a diverse and/or opposing view of the phenomenon of interest. On the other hand, bridging is the process of developing a consensus between qualitative and quantitative findings(Lewis & Grimes, 1999).

In this chapter, the discussion is organised around the results of the hypotheses testing. The findings with respect to how the research model was constructed and validated will progress as follows:

- Discussion of the hypotheses regarding UTAUT and UTAUT2 model constructs.

- Discussion of the hypotheses regarding constructs adapted from other literature

- Discussion of the hypotheses regarding constructs developed based on qualitative findings.

- Comparison of results between TMSP users and non-users.

6.1   **UTAUT Constructs Hypotheses**

As illustrated in Chapter 2, the UTAUT model comprises four primary constructs (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions). This study has used the UTAUT model as the foundational conceptual framework to exploring the factors associated with the acceptance of TMSP systems. All of these constructs were discussed in the qualitative phase of this study and they were validated in the quantitative phase. In the following sections, I will discuss the results from both the fieldwork and survey as they pertained to these four constructs.

6.1.1   *Performance Expectancy*

Performance Expectancy (which encompasses perceived usefulness) has been validated in several studies to have a positive impact on usage intention. In fact, many researchers, including Venkatesh et al., found Performance Expectancy to be more influential on behavioral intention than the rest of the UTAUT model's constructs (Al-Gahtani, Hubona& Wang, 2007;

Tero Pikkarainen, Kari Pikkarainen, Heikki Karjaluoto& Seppo Pahnila, 2004; Venkatesh, Morris, Davis& Davis, 2003). In this study, it was expected that a positive correlation would also be established between Performance expectancy and Usage intention. One focus group participant helped in setting up this expectation:*"If I send the report by using this app and they receive it and do something about it, then of course I will use this app because it seems useful."* *(FG4 P5).*

Surprisingly, the survey results indicated that Performance Expectancy had no significant effect on usage intention. This is in contrast to both our qualitative findings and previous literature (Ifinedo, 2012; Schaper & Pervan, 2007). This might suggest that performance expectancy and the related advantages of technology may not motivate a citizen to use TMSP systems. Having knowledge about a system's ability to do a task has an insignificant impact onusage intention. Another explanation of this finding can be understood by examining the previous quote. The participant made his use conditional when he stated 'and do something about it'. As a result, and in the absence of action from report receiver, the TMSP performance is viewed as less significant. Simply put, an expectation of an incident report being ignored would be demotivational regardless of how well the app performed technically..

6.1.2 *Effort Expectancy*

This construct measures the degree of ease associated with the use of the system(Venkatesh et al., 2003a). Qualitative results matched four factors (Ease of Use, Functionality, Technical Support and Effort Level) to Effort Expectancy. Similar to Performance

Expectancy, this construct has been validated in previous studies, and was found to have an impact on Usage Intention. The qualitative findings of this study also called for testing this construct in the model. One female participant commented on the effort needed to use TMSP systems, and how it correlates to the Usage Intention:

> *"Are these applications in Arabic? I do not usually use applications with English screens. They are too difficult for me, but do not get me wrong, I understand the simple screen instructions such ok and cancel."(Interview 4)*

Although this participant focused on Interface language, it shows that, if these applications require any additional effort, such as translation, then this may negatively impact Usage Intention.

Contrary to the literature and qualitative results, Effort Expectancy was found to have no effect on Usage Intention. This finding is not entirely unexpected for several reasons. First owning a smartphone and having experience downloading applications was one of the survey's sample inclusion criteria; therefore, this was routine in daily life for all of the 684 study participants. Moreover, as discussed in the first chapter, Saudi Arabia is one of the most advanced countries in ICT development, with a high smartphones penetration rate. In a study of Usage intention in Saudi Arabia, Al-Gahtani et al. (2007) argued that predicting intentions based on Ease of use becomes less important when users have more experience with technology. Another explanation that concurs with the findings of Al-Jabri (2015) is that citizens may perceive mobile reporting applications as just as easy as any other reporting channels, such as using the telephone or completing web forms. This perception could lower the importance of Effort expectancy as a motivational factor to Usage intention of TMSP systems.

6.1.3 *Social Influence*

The degree to which an individual believes in the importance of the opinions of others about whether or not he or she should use a new technology is the definition of Social Influence. Participants in the focus groups and interviews emphasised the importance of Social influence as a motivational factor in the use of TMSP systems. They referred to family members, peers, and role models as major influencers in their social circles. This is expected because the level of social influence usually is determined by the greater culture of the population. Arab societies, including Saudi society, are more collectivist in nature and therefore have stronger ties connecting individuals(Hofstede, 1994). This naturally increases the effect of Social influence in a Saudi citizen's attitude towards accepting a new technology, as in the case of TMSP systems. Numerous research studies in the literature have found that Social influence has a strong impact on users' adoption level of a new technology (Dwivedi, 2009; Venkatesh & Brown, 2001). However, several participants in the group and individual interviews extended the notion of "social" to include extended family members (tribe) and role models.

> *"Not everyone will convince me to use this app. When my brothers, cousins and my friends at the 'Istraha' download it and advise me to use it, then I will for sure try it."(FG3 P1).*

> [Istraha is an indoor space that is usually located outside of the city. It is typically rented for the enjoyment of friends and relatives in weekly or monthly gatherings.]

As expected, the quantitative results confirmed the qualitative results and found that Social influence indeed has a positive effect on Usage intention regarding TMSP systems.

6.1.4　Facilitating Conditions

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the new systems. In the UTAUT model, Venkatesh et al. (2003) suggested that Performance expectancy, effort expectancy, and social influence affect users' behavioral intention to use technology. On the other hand, Facilitating conditions directly affected actual use. Furthermore, a key assumption in the technology acceptance literature is that Behavioral Intention to Use (BIU) has a direct and significant relationship with Actual usage. However, no consensus has been reached between opposing camps of researchers. The study by Teo (2011) contributed to the existing debate by testing competing models involving BIU and Actual usage, using a sample of 131 university students. The results provided some support for using behavioral Intention to use as an acceptable proxy to measure Actual usage.

Previous studies have proved the positive impact of Facilitating conditions on Usage of technology (van Dijk, Peters& Ebbers, 2008; Venkatesh et al., 2003). Both the qualitative and statistical results of this study suggest a positive effect on usage intention of TMSP systems. This finding is consistent with the research assumption. A lack of technical infrastructure, or inability to own or use a Smart Phone in the study's context, poor network connection or failure in data (reports) transfer all are expected to negatively affect Usage intention. Therefore, it is no wonder this model's construct is amongst the highest predictors of TMSP use in the context of Saudi Arabia.

6.1.5 Hedonic Motivations

Hedonic Motivation is "the fun or pleasure derived from using technology" (Brown & Venkatesh, 2005). In UTAUT2, the Hedonic Motivation construct replaced (Davis, Bagozzi& Warshaw, 1992)Perceived Enjoyment and has been shown to play an important role in determining technology acceptance and use.

Although these constructs were not part of the original UTAUT model that was the starting place for developing our mode, the interview data suggested extending this by adding this construct from UTAUT2. Recall that I am focused on mobile incident reporting TMSP systems. Mobile applications in general have a hedonic, enjoyment component embedded. This appeal of application stems from the fact that interacting with the mobile phone itself has become an enjoyable experience. Mobile phones have significantly extended their purposes from voice communication devices to personal computers.

Fun, feeling good, communication tool and Indirect benefits were amongst the terms expressed by interview participants that helped in shaping hedonic motivation constructs in the model. Some of the participants addressed the utilitarian nature of mobile incidents reporting applications; however, when given some examples of the citizen science applications (a class of TMSP systems), they were enticed by the gamification used in some of these applications:

> *"I loved the idea of folding protein you told us about! I guess making all reporting application as games will attract many people including myself, but I am not sure if my mother wants to play a game. She prefers to use Twitter. Also I'm afraid my reports will not be taken seriously because it is a game at the end."*
> *(FG1 P2)*

"I spend all my day on my phone, my iPhone is my life and my husband hates this. Of course I will download the app and use it. I want to know, will they fix the problem or not. It is fun to feel important. You know when the ministry of commerce change something based on a report I sent. That's something I can tell my friends about!" (Interview 5)

The results of the PLS analysis of the survey data is in line with previous research(Alalwan, Dwivedi& Williams, 2014; Al-Busaidi, 2012; Wang, Chang, Chou& Chen, 2013) in which the Hedonic Motivation, including enjoyment factors, were found to have a positive impact on the Usage Intention of TMSP systems.

In the previous section, I discussed the findings of the constructs pertaining to UTAUT and UTAUT2. Table 6.1 provides a summary of the results concerning the hypothesised relationship between these constructs and Usage intention.

Relationship	Results
Performance Expectance and Usage Intention of TMSP systems	Not Supported
Effort Expectancy and Usage Intention of TMSP systems	Not Supported
Social Influence and Usage Intention of TMSP systems	Supported
Facilitating Conditions and Usage Intention of TMSP systems	Supported
Hedonic Motivation and Usage Intention of TMSP systems	Supported

6-1 Summary of UTAUT and UTAUT2 Hypotheses Testing Results

6.2 Literature-based Construct Hypotheses

Recall that three different sources were used to assemble constructs to develop this dissertation' model of TMSP system acceptance; UTAUT/2 models, other literature, and the data from my field work. In this section, I discuss the three model constructs that were mainly adapted from the literature to complement the UTAUT/2 constructs. These were specifically adapted for the model because they had been validated in previous research and were found to have either a positive or negative effect on Usage intention. Trust, Privacy Issues, and Participation Cost are all critical factors when dealing with technology or when studying the acceptance of technology. Each will be discussed in turn.

6.2.1 *Trust*

Incident reporting mobile applications involve interacting with governmental agencies, such as police, ministries, and city councils. A lack of trust in such social systems may serve as a barrier to their acceptance and use. Numerous research studies have examined Trust as a predictor of technology usage intention and found it to have an impact on technology acceptance and usage intention (Bélanger & Carter, 2008; Carter & Bélanger, 2005; Palvia, 2009). In my study, it is indicated that trust may play two contrasting roles: as a motivational factor or as a barrier to TMSP system use. Participants stated that trusting the government agency necessitates transparency in how they handle reports by citizens. Users also need assurance that reporting violations will not directly or indirectly penalize them.

Although the PLS analysis of the survey data showed that Trust does impact the Usage Intention of TMSP systems with (t-test = 2.097 >1.98), the correlation between Trust and Usage Intention was close to zero (0.81<0.01). This implies a weak relationship, despite the assumption

that trust would be well-supported based on the field work and prior literature. One possible explanation is that Saudi culture is characterized by high avoidance (Hofstede, 1994) and a preference for face-to face interaction. This characterization contradicts the fact that a lack of trust caused by interacting with mobile applications could negatively affect the usage intention. Using TMSP systems may enhance the trust because it allows citizens to avoid high communication conflict especially when the report has sensitive information. On the other hand, due to Saudis' preference of face- to face communication, the TMSP systems may reduce the trust in government agencies when people do not report something personally. The technical mediation contribute to the lack of trust as some citizens will not feel the government will act upon their reports due to the passive effort they have done by using the technology to report an incident.

6.2.2   *Privacy Issues*

There is a general sense that government, especially throughout the Middle-East, typically controls all aspects of life, including technology. People typically do not trust the government not to utilize technology to spy on them and try to control them(Burkhart & Goodman, 1998). Qualitative findings suggest that a lack of privacy in TMSP systems could negatively affect the rate of their acceptance and adoption. Participants have expressed the importance of anonymity in the design and use of these applications.

> *"I would like to use them, but the first screen you showed us ask for my name and mobile number! Or even worse my national ID! Do they think I want them to know my identity?"(FG2 P1)*

"What happens if I report my neighbor who is wasting water on washing his old car? What if he knows one day that I am the one [who] reported him!" (Interview 1)

"I think all women will not like [to] provide their names. I don't want to generalize but I know that we do not like to tell others about our real identity. I personally think my father will not encourage me to use something that reveals my name." (FG6 P3)

These quotes foreground that Saudi citizens are concerned about issues associated with revealing their true identity. However, the quantitative analysis of the survey data showed an insignificant relationship between Privacy Issues and Usage Intention concerning TMSP systems. During the individual and group interviews, participants were introduced to the concept of incident reporting mobile applications via a real-world scenario and follow-on discussion. In contrast, the survey participants were given scenarios and examples of these systems through screenshots. This may lessen the seriousness of the issue of privacy for survey participants. In the focus groups, the participants were able to engage directly with the system while during the surveys there was a less engagement and maybe the screenshots were not very reflective of actual reporting experience.

Another explanation is related to the specific domain used as an example of TMSP systems. In phase one of this study, a shop violations reporting system was used to orient participants unfamiliar with these kinds of systems. Privacy issue, as with any different measure, is dynamic; concerns may go up or down based on the application domain at hand. In this study's case, some of the TMSP systems did not cause any concern, especially those that did not report human beings, such as reporting a pothole or a tree having fallen on the street. I argue that

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Privacy Issue could be well-supported as negatively impacting Usage Intention if the discussion was only limited to incident-reporting mobile applications involving other people.

6.2.3 *Participation Costs*

The study participants expressed their participation cost concerns in terms of two things: money and time. According to Behavioral Decision Theory, the cost-benefit pattern is significant to the acceptance and adoption of new technology. The hypothesized negative effect of cost on Usage intention was confirmed in the PLS analysis. Technology mediated social participation systems that are designed for the public good are voluntary in nature. Citizens are introduced to them and are expected to contribute use in order to be engaged in their communities. However, as expected, this participation and engagement might be compromised when system usage incurs costs.

In this section, I discussed the findings for the constructs adapted from the technology acceptance literature to extend the TMSP acceptance model. Table 6.2 provides a summary of the results of the hypothesized relationship between these constructs and Usage intention.

Relationship	Results
Trust and Usage Intention of TMSP systems	Supported
Privacy Issued and Usage Intention of TMSP systems	Not Supported
Participation Cost and Usage Intention of TMSP systems	Supported

6-2 Summary of Technolohy Acceptance Literature Hypotheses Testing Results

6.3 Discussion of New Constructs Locally-Developed

Despite the fact that most, if not all, of the model constructs from the literature were discussed during the individual and group interviews, three constructs were added to further extend the model based on the attention they received during the interviews. These three constructs (Sense of Community, Expectation, and Cultural Values) were not previously published as part of Information Systems acceptance models, but were clearly important to our study participants. Several keywords were identified during the coding and analysis of the qualitative data which were used to form these new constructs. In the survey, these were operationalized through items built directly from participant quotations. In the following sub-sections, I will discuss the quantitative and qualitative findings for these constructs.

6.3.1 *Sense of Community*

McMillan proposes that Sense of Community is defined as members' feelings of belonging and being important to each other, as well as a shared faith that members' needs will be met by the commitment to be together (McMillan & Chavis, 1986). The Sense of Community construct is composed of four elements: membership, influence, integration and the fulfilment of needs, and shared emotional connection. Previous studies show that citizens with a strong Sense of community tend to commit to, support, and exchange information with others(Wellman, 1998). TMSP systems used for the public good are designed to exchange information between citizens and governmental agencies. This suggests examining the relationship between the Sense of community elements and their impact on Technology acceptance. In the following, I will

discuss the sense of community elements seen to have emerged during focus groups, with their impacts and priority on TMSP systems acceptance.

Membership

There are many different types of applications supporting public service improvement, such as community policing, crime prevention, neighbourhood maintenance, and incident reporting. In using one of these systems, a citizen will contribute a piece of information to the governmental agency, possibly opening a dialogue on the issue leading towards a satisfactory resolution. This contribution is a form of personal investment that is related to members' emotional attachment and their sense of community (Wiertz & Ruyter, 2007).

Membership is the feeling of belonging or a shared sense of personal relatedness. The interview participants indicated that they were willing to use such systems precisely because of the enhanced feelings of belonging they get in use, such as:

> *"I'm motivated to participate by the feeling that I'm part of the community and I can give people the information they need. I might not get a direct benefit if I tell the government about the problem, but using this system will make me believe I'm a good citizen of Saudi Arabia." (FG3P3)*

Influence

McMillan and Chavis describe Influence as a bidirectional concept where citizens feel the influence by and on community. However, participants in the interviews emphasised only one direction, which is the influence they feel when they use TMSP systems within the community.

Members of a community must feel empowered to have influence over what a group does; otherwise, they will not be motivated to participate. For example, a participant noted:

> *"Let's be honest. We're all Saudis and we know that we have a minimal influence in our country's policy. We don't have elections like other countries and I do not want to talk too much about this topic. You all know that using a system to inform the government agency that my street has a pothole is not a big thing, but I really crave the ability to change stuff. I want to tell my friends the government fixed the street just because of me!" (FG4P2)*

Integration and Fulfillment of Needs

Being part of a community means that a member can receive what they hope to receive through their membership. It reinforces the idea that a community needs to solve a problem for its members in order to make the work of belonging worth their time and effort. An individual's needs are determined by their culture and family, which teach them a set of personal values that dictate their emotional and intellectual needs and the order in which they would attend to them. Members need to feel rewarded in some way for their participation in the community in order to continue to contribute. Feedback, positive outcomes of participation, and other intangible rewards dominated the discussion amongst our participants when asked about what would incentivise them to use TMSP systems. One representative comment was:

> *"When I download the application on my phone and participate by using it, I really want to see an actual result of my participation. Do not get me wrong, I would like them to give me some cash for my contribution [group laugh], but I care more about knowing my participation does not go to waste." (FG1P5)*

Among the few studies linking Sense of community to technology acceptance, Lim (2014) and Tsai et al. (2011) both focused on the online sense of community and found it to have a significant impact on technology acceptance. In this study, the qualitative analysis showed that Sense of community elements have different rank and importance in relation to their impact on a citizen's decision to use a civic engagement system or any kind of TMSP. Influence came in the first rank, followed by integration and fulfilment of need, with membership last. The qualitative findings suggest it would be valuable to take this into consideration when extending technology acceptance models and designing TMSP systems with a greater likelihood of sustained adoption. Moreover, quantitative findings concur with previous research and with the qualitative findings, confirming the direct relationship between Sense of community and Usage intention.

6.3.2   Expectations

Outcome expectations is a major cognitive factor in influencing users' behaviour (Compeau & Higgins, 1995). One of the model constructs found to be related to elements of Expectancy Theory is Expectations. This theory is based on the notion that motivation relies on anticipation of positive outcomes. This implies that the public would be more eager to accept TMSP systems and participate when they expect a positive result stemming from their participation.

Expectancy Theory informs the design of systems to share knowledge between organizations and the public to improve the likelihood of sustained public engagement. Simply, citizens are more apt to accept the technology and report incidents when they know that their efforts are appreciated by the organisation and bring about change.

Individual and group interviews confirmed that expectations should be a part of any technology acceptance model. Participants differentiated between the 'technological' Performance Expectancy (which answers the question: Does the incident reporting app do what is designed for or not?) and Expectations (which answer the question: What are the outcomes/consequences of accepting and using the incidents reporting mobile applications?)

In this study, participants referred to several factors that aggregated together to form the Expectations constructs. Among these factors are appreciation and recognition by the agency, monetary rewards, philanthropy, and measurable actions. I argue that Expectations could have a measurable impact on user intention. All of the qualitative data confirmed this argument and further supported the view that citizens expected a valuable outcome from their use of these incidents' reporting systems. This aligns well with Baker-Eveleth et al. (2008), who found that users need to see the value and outcome of the system in order for them to accept technology and use it especially if use is volitional.

In this study, I found value to be a nuanced and subjective term. Different citizens will have different expectations and values of the outcome of their TMSP system use. This creates a challenge for governments and TMSP system designers as expectations are not one-size-fits-all. For example, the survey analysis revealed that the most frequently endorsed strong agreement reported by almost more than two-thirds of the respondents was for "E21: Seeing positive results of my report is very rewarding" (n = 473, 69.2%). However, one of the interview participants has a totally different motivational incentive:

> *"In my view, money is the biggest incentive to use this application especially if no one forces me to use it. If some shops cheated on me, then I do not need any*

money to report it but if we are talking about reporting a pothole on the street somewhere away from my house then I would like some money. I am not selfish, but nothing is free these days."(FG3P1)

Other participants emphasized that they would be willing to accept TMSP systems if they received feedback about their reports, which confirmed that individuals would adopt mobile services more quickly if the government was more responsive. This example shows that, despite the valance (that is the difference in value the individual personally places on the rewards), Expectation could have a positive effect on Usage intention of TMSP systems.

Based on the promising qualitative results, I anticipated Expectations to be supported in the survey. However, the PLS analysis of the proposed acceptance model revealed an insignificant relationship between Expectations and Usage intention. This incompatibility in findings between the qualitative and quantitative results could be the result of one of many different reasons.

First, and most simply, this contradiction in results could be caused by the instrument. The Expectation construct is one of the survey components solely developed based on the qualitative data. All individual question wording came directly from actual participant quotes. Despite the survey development following a rigorous validity and reliability procedure, there might be the possibility that Expectations fell short in construct validity. This is always possible as these items were never validated in previous studies. This also shows one of the advantages of using a mixed-methods approach, where each strand of the study complements the other one.

Another explanation could be that the items failed to correctly aggregate to one unified construct: for example, the most endorsed agreements in the survey come from expectations items, as the following: "*E19: I will use the reporting apps if my report solves the problem*" (62.0%), "*E17: Getting feedback is very important to me when I use reporting apps*" (60.1%). These examples show that survey participants agree with the interview participants; they both consider the outcome and value of their expectations; however, the PLS analysis failed to capture the effect of all these items when aggregated together.

Moreover, with more than two-thirds of the survey participants in the study sample having never used any kind of TMSP system in the past, it could be difficult for them to extend their expectations of something they have never personally experienced. All of these reasons could explain why Expectations cannot be proven to have a significant effect of Usage Intention, despite the strong qualitative support of the direct effect.

6.3.3   *Cultural Values*

Previous studies concerning technology acceptance and adoption have shown culture to be a key factor in the acceptance of new technology (Leidner & Kayworth, 2006). Because most of these studies have been conducted in a Western context, it has been proposed that acceptance models should be validated in various other countries considering the influence of diverse cultural factors (McCoy, Galletta& King, 2007).

In a recent study (Van Belle & Cupido, 2013), the UTAUT model has been adapted to determine the key factors influencing public participation intentions in South Africa's local government via mobile phones. Their findings suggest adapting the model in different countries with caution as different culture or context could impact the acceptance factors of new

technologies. Another study by Gupta et al. (2008) found the UTAUT to be a valid model in helping to understand the adoption and successful use of technology in developing countries. Oshlyansky et al.(2007) collected data from nine countries around the world to validate the UTAUT from a cross-cultural perspective. They concluded that the UTAUT model can provide insights into cultural differences and values in terms of technology adoption and use.

On the other hand, there is a body of research suggesting that behavioral models may not hold universally across cultures, meaning that cultural differences between countries may impact the acceptance and use of ICT's (Srite & Karahanna, 2006).This tension calls for a more detailed investigation to examine whether or not behavioral models universally hold across countries and cultures, and if not, what aspects are more transferrable than others.

Cultural contexts play a crucial role in the applicability of these general acceptance models. Evaluating these general models in different countries does not simply mean adding a new construct—a new box or two—but rather evaluating the relevance of the entire existing model in the new context, and accordingly modifying them as needed. Context should be a critical component of our theorising. This study was motivated by Gary Johns' work on the essential impact of context.

> *"Imagine conducting a research study in which you expect variable x to cause variable y but instead discover that y causes x. Imagine doing a study in which you anticipate a strong positive relationship between two variables but instead find a strong negative relationship. Imagine conducting an investigation in which the base rate of some crucial organisational behavior varies by a ratio of 35:1 between subsamples. Surprises of this nature should surely capture our attention, and they are frequently a product of our failure to consider contextual influence when doing research."*(Johns, 2006).

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As discussed in Chapter 2, the objective in this research is to investigate the factors motivating the acceptance of TMSP systems in the cultural context of the Kingdom of Saudi Arabia. The ultimate goal of this research was to develop a new culturally relevant configuration of an information systems model (and accompanying instrument) that was optimized to predict the acceptance of mobile systems for civic engagement in KSA.

KSA has inherited a rich history of civilization that shapes the culture and society of Arabian Peninsula. Religion in particular, as a part of the national culture, plays an important role in setting the social norms, patterns, traditions, practises, and daily activities of Saudi society (Al-Saggaf, 2004).In order to understand the acceptance and adoption of new technologies in Saudi Arabia, it was important to consider the full cultural context of the country. Saudi culture is determined by various unique aspects that distinguish it from other countries. Arab societies generally are collective cultures, which encourage dependence on family members and friends. Understanding the cultural values, context and dimensions for the study-targeted population, Saudi citizens, is crucial in order to develop a TMSP acceptance model and subsequently identify the key factors influencing the acceptance of these systems.

In this study, several themes have emerged in the analysis of the qualitative data, confirming the direct effect of culture on technology acceptance and usage intention. Some key themes are nepotism, religious views, and gender differences in the Saudi context. This was expected as religion shapes people's lifestyle in Saudi Arabia. The country has no man-made constitution, relying on the Quran itself instead. The citizens of Saudi Arabia have a long history of rejecting new technologies because of religion perception: for example, when microphones were introduced into the country, many people protested against using them because they

thought the sound was amplified by Satan! Of course, anything coming from Satan goes against religion. Television had almost the same reaction, with women covering their faces when watching TV, thinking that male news anchors could see them. In Saudi Arabia, women cover their faces around male strangers because of religion. In addition, Saudi Arabia was one of the few countries to ban smartphones with a built-in camera, with this ban also for religious reasons. While Saudi Arabia is becoming a more moderate country; their history of carefully evaluating new technologies continues to affect the orientation toward any new technology.

In this study's context, this quote shows one side of how religion may affect the acceptance of TMSP systems:

"Islam is the religion of forgiveness. Our prophet has advised us to cover others mistakes and forgive them. I think this app is contradicting the forgiveness concept. Is there any way to warn the shop owners instead of reporting them to the government?"(FG5P3)

In regards to gender differences, Saudi society can be described as conservative and religious. In Saudi Arabia, gender segregation is encouraged by Islam and Saudi culture is mostly derived from Islamic holy books. Nowadays, gender segregation is observed in schools, hospital wards, some shopping centres, which have been assigned days of the week for women with the rest for men, with this same approach applied in workplaces and, most importantly, in government offices. Moreover, women in Saudi Arabia are not allowed to drive, which means they are highly dependent on men. Taking this context into consideration, the qualitative results show that women are more likely to accept and use incident reporting systems.

As Saudi society relies on males to provide for their families, a larger number of women do not work. Thus, women are afforded more time to 'play' with their mobile phones, with one of the female participants justifying her position about which gender uses these mobile applications more. Furthermore, when Saudi females are not allowed to visit government offices, I argue that these applications will be beneficial for them, especially when considering issues that currently only allow face-to-face reports. These applications will enhance the female role in the community, which was weakened by the segregation; eventually, they will become more involved in their communities.

On the other hand, there are many barriers for women preventing them from using and accepting such systems: for example, one female participant commented:

"Our culture is sexist! Saudis in general believe men more than women. I find it hard to believe that government agency will react to my report the same way they do for a report coming from let say my brother or father"(FG6P2).

Finally, this study demonstrates the significance of cultural context when validating technology acceptance models. The keywords identified in the interviews (see Table 4.1) tend to belong to one of three categories relevant to the technology acceptance models:

- Universal Term, which turns out to have the same meaning used in existing model.
- Universal Term, which turns out to be different than the meaning used in existing model.
- Unique Term, which has a meaning that is relevant to only to the context of users in the Kingdom of Saudi Arabia.

Based on the interviews, it was found that some terms, such as Easy to use, have the same meaning in validated technology acceptance models. Participant (FG2P4) said:

"I will use an app to report a shop when I don't have to learn how to use it. I think if the app is easy to use and its language in Arabic, then I will use it! I think these apps should be as easy as using a phone to do the same task."

This aligns well with the Effort Expectancy construct of UTAUT: the degree of ease associated with using a particular kind of technology.

An example of a universal term that does not conceptually align with an existing model is that of Social influence. This term is defined as: the degree to which a user perceives that important others believe they should complete a particular task. The difference in meaning here comes from the representation of 'important others'. Existing studies conducted in Western countries show that participants usually refer to this as their bosses, spouses and parents. However, Saudi participants stated that important others include their extended family members, cousins, neighbours, role models and tribe officials.

Finally, a concept that is uniquely relevant to the Saudi Arabia context is that of nepotism or always prioritizing family over strangers. This cultural factor was found to be frequently mentioned across the focus groups, with several participants having made it clear that they might not accept or use this kind of technology to report one of their relatives who happens to be a shop owner.

"I come from a small village in the southern part of the Kingdom. Most, if not all, of the shops' owners are my cousins. I will find it very difficult to report my tribe members to the government even if they do something wrong." (FG4P3)

The qualitative findings show that existing universal models may partially predict the acceptance and use of new technologies. However, they fail to include the contextual and

cultural constructs that can be identified by conducting fieldwork to understand the context and environment where the technology will be used.

Unexpectedly, the quantitative analysis of the survey failed to prove any significant effect of cultural values on the Usage intention of TMSP systems. This surprising finding could be explained by some of the similar issues discussed earlier in this chapter regarding Expectations construct. Survey items' validity may affect the findings of the quantitative study. Another important explanation is the complex nature of this construct. It is harder to align concepts when dealing with the more fluid ideas of culture. Thus high construct validity is more difficult to achieve. This is why qualitative data collection techniques allow for deeper engagement with participants. Engagement with participants could help in gaining better understanding of this contextual complex factor that cannot be statically inferred via survey instrument.

In the previous section, I discussed the findings of the constructs that were developed based on qualitative results to extend the TMSP adoption model. Table 6.3 provides a summary of the results of the hypothesised relationship between these constructs and usage intention.

Relationship	Results
Sense of Community and Usage Intention of TMSP systems	Supported
Expectations and Usage Intention of TMSP systems	Not Supported
Cultural Values and Usage Intention of TMSP systems	Not Supported

6-3 Summary of Hypotheses Testing for Constructs Locally-Developed

6.4 Comparison: Users vs. Non-users of TMSP systems

An early adopter is a person who embraces new technology before most other people do. According to Diffusion of Innovations theory, formulated by Everett Rogers (Rogers, 1995), early adopters make up 13.5% of any population. In this section, I will discuss the findings of hypotheses testing for users (early adopters) of TMSP systems as well as those who did not have any personal experience with it at the time of data collection.

The predictive power of the research model for explaining the participants who have never used any kind of TMSP systems (R^2=0.513) was higher than for those who already used any TMSP systems at least once (R^2=0.508).Although the difference in the R^2 between two models is small, it was expected that the non-user models would have a higher predictive power. The non-user participants have never used any TMSP systems prior to participating in the study; therefore, they have not accepted the system used as an example in the data collection phase. On the other hand, the predictive power of the model was a slightly lower for the early adopters due to the fact that they already have used the technology once, which indicates a prior acceptance of such systems.

In the following sub-sections, a comparison of the factors of TMSP acceptance and adoption between users and non-users reveals a number of interesting differences.

6.4.1   Supported Hypotheses for Both Groups

Three hypotheses were found to be supported for both users and non-users of TMSP systems. Social Influence, Facilitating Conditions and Cost of Participation. This first result is expected as both groups perceived the influence from their social circles as either affecting their intention to accept TMSP systems or as sustaining their use of them. Facilitating conditions is also important for both groups as having technical capability and organizational opportunity could be a deciding factor regarding accepting or continuing to use technology. Finally, the cost of participation also proved to have a direct negative effect on Usage intention for both. A non-user may pay a small fee or charge to download the app and use it; however, it is not guaranteed that these applications will thrive if they cost money, especially with their voluntary nature.

The significance of these relationships to Usage intention should be considered by government agencies and TMSP designers. It is clear that these three factors are not only important for citizens who have never used TMSP systems in the past, but also in sustaining use among the early adopters.

6.4.2   Supported Hypotheses for the Non-users Group

Two hypotheses were uniquely supported for the non-users group: Sense of community and Trust. These two constructs were not found to have a direct effect on Usage intention for those people who have already used TMSP systems. One explanation for this is that a Sense of Community may be something that non-users seek before accepting the TMSP systems designed for engagement and public good. Once the is actively by sending incident reports then the appeal of this factor of membership and influence will gradually vanish. Although this is the defensible explanation, it does not align with the results garnered by Ellis (2013) where he found that the passage of time did not appear to function as an intervening variable in the development of Sense

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of Community. However, his study targeted online learning environment members, which are different than this study's targeted participants. Moreover, he examined the Sense of Community with a homogenous all users sample, whereas in this study context, the comparison is between non-users and established users.

The second construct found not to have a direct effect on usage intention is Trust. This could be explained where Trust is commonly a concept that someone builds before using the service. I argue that targeted users need to trust the mobile incident reporting applications before they accept them. Once accepted, trust is already established and is no longer a concern. This could explain why the PLS analysis failed to show Trust impact on the TMSP systems users group. These findings call for people in charge to raise awareness and accordingly address the trust issue. Citizens need to be ensured that their acceptance of TMSP systems will result in measurable, transparent actions, and no harm will be caused by their use of TMSP systems.

6.4.3 Supported Hypotheses for the Users Group

One hypothesis was supported only by the data provided by the users with prior TMSP experience: Hedonic Motivation has a positive effect on Usage Intention. The model does not predict a positive effect on Usage intention for non-users, however. One explanation for the lack of support lies in the concept of hedonic motivation. Users already using these TMSP systems may perceive various enjoyment factors that cannot be experienced by those who never tried them before. The non-user may not have the desire to accept and use the TMSP because they do not have any insight into how joyful or beneficial it is to use such systems. This also requires TMSP developers to raise awareness and shed light on both the utilitarian and joyful experience of such systems.

There was insufficient statistical evidence, however, at the.05 level, to support five of the hypotheses (β ≈ 0, p >.05). The multilevel model indicated that Performance expectancy, Effort expectancy, Expectations, Privacy issues, and Cultural values had no statistically significant effects on Usage intention (see Table6.4 for a summary on the results of the hypotheses testing results for both groups).

Relationship	Users Result	Non-Users
Performance Expectance and Usage Intention	Not Supported	Not Supported
Effort Expectancy and Usage Intention	Not Supported	Not Supported
Social Influence and Usage Intention	Supported	Supported
Facilitating Conditions and Usage Intention	Supported	Supported
Hedonic Motivation and Usage Intention	Supported	Not Supported
Trust and Usage Intention	Not Supported	Supported
Privacy Issued and Usage Intention	Not Supported	Not Supported
Participation Cost and Usage Intention	Supported	Supported
Sense of Community and Usage Intention	Not Supported	Supported
Expectations and Usage Intention	Not Supported	Not Supported
Cultural Values and Usage Intention	Not Supported	Not Supported

6-4 Summary of Hypotheses Testing for User And Non-User of TMSP Systems

In summary, the comparison between the hypotheses-testing results revealed that there are differences between what drives non-users of TMSP systems to accept them and what makes users of TMSP systems sustain their usage of TMSP systems. When designing TMSP systems, it is important to take into consideration what factors have the most effect on user decisions.

6.5   **Discussion of Conflicting Findings**

This chapter has discussed the integrated findings from the field work and the survey. As highlighted, they did not always agree and that is actually a good thing. These apparent conflicts are expected when combining diverse research methods in one single study. Integrating findings from both methods in a meta-inference is essential for the validity of this approach of research. However, a consistent integration of findings from diverse methods is not easy to come by; there are numerous obstacles on the road to such integration (Bryman, 2007).

Teddlie & Tashakkori (2009) argue that integration does not necessarily require consistency, however, it is important to understand what caused this inconsistency in the findings. Qualitative methods allow for deeper understanding of a phenomenon; therefore, one possibility for the conflict is a problem of quantitative methods which have to simplify and generalize away from context. One claim is that standardised measures are based on statistical probabilities that address wide populations and consequently are not suitable for assessing individual behavior (Slonim-Nevo & Nevo, 2009). In this study context, I sought to understand the behavioral intention of accepting a new technology in a unique cultural context—that of Saudi Arabia. Accepting and rejecting are psychological behaviors that are complex; thus, the survey method does not effectively allow entry into the internal, subjective world of the individual. Therefore, it should not be surprising to find a difference in subjective reporting findings through interviews and the general statistical analysis reported by a survey.

An alternative possibility for the results' inconsistency is that I am actually not comparing two results in order to examine the difference in the two studies. In the qualitative data, I aimed at building a TMSP systems acceptance model where, in the quantitative part, I

validated the model built in the first phase. I argue that not finding a significant relationship in the quantitative statistical analysis does not indicate conflict in results; rather, it may suggest that I used two diverse methods to assess two different entities. The first phase's goal is different to the second one, which means that I only have to report the findings and not force the meta-inference between the two findings. Comparing two methods' findings usually conducted in concurrent mixed methods, and not a sequential design, is the one used in this study (Creswell & Plano Clark, 2007).

Because this study design is a sequential mixed methods design, another reason could be that the elapsed time between the phasesmay affect the findings and bring about conflicting results(Slonim-Nevo & Nevo, 2009). In the context of this study, there was a gap of almost one year between the end of qualitative data collection and the start of survey data collection. During this period in between, few new TMSP systems were introduced to Saudi citizens (see Chapter 2). This elapsing time may have an effect on what people think at the time of interviews, and what they actually feel at the time of the survey study.

Despite the rigorous validation procedures completed for both qualitative and quantitative, some conflict in the results was found. This conflict was handled through the process of bracketing and bridging. I provided explanations for the unexpected results, and the last section discussed the possibilities leading to this conflict.

In summary, inconsistency in the findings does not necessarily mean contradiction. In fact, these apparent tensions cause the researchers to go deeper in their understanding than if they had just done a single method research. Finally, the study at hand is very complex and such unexpected results should be expected.

6.6 **Summary**

As a conclusion, the quantitative findings suggest that the TMSP systems usage intention is a function of Social influence, Facilitating conditions, Hedonic motivations, Trust, Sense of community, and Cost of participation.

On the other hand, the qualitative findings show that existing universal models may partially predict the acceptance and use of new technologies. However, they fail to include the contextual and cultural constructs that can be identified by conducting field work so as to understand the context and environment where the technology will be used. They also show that public participation enhances the harmony of community members; it magnifies the feeling of self-importance and further supports the Sense of community belonging factor. Moreover, Expectation was found to have an important role in affecting Usage intention concerning TMSP systems.

Designing TMSP systems for a unique context, such as that of Saudi Arabia, should not rely on existing technology acceptance models that were validated in a Western context. This study, despite the conflict in quantitative and qualitative finding, is calling for a comprehensive approach of research when considering such a complex phenomenon.

Chapter 7: Conclusion

This dissertation explored the contextual factors motivating the acceptance and adoption of Technology Mediated Social Participation (TMSP) systems in the Kingdom of Saudi Arabia. It used this understanding to inform the development of culturally appropriate TMSP system acceptancemodel. This chapter highlights the primary contributions of this research project. Subsequently, theoretical and practical implications of the dissertation's findings will be discussed. This chapter closes with a discussion of the study's limitations and suggests directions for future research.

7.1   **Summary of Findings**

In conjunction with governments around the world realizing the importance of engaging citizens in their communities through technology, there was a need to examine the factors making these technologies acceptable and usable. This research was motivated by many issues; among them was the lack of previous studies that investigated the acceptance of TMSP systems in a non-Western context such as the Kingdom of Saudi Arabia. This research was carried out by conducting a carefully balanced mixed-methods study. The following is a summary of the major findings of the research.

First, this research has identified 11 themes pertaining to the acceptance of TMSP systems in Saudi Arabia. These themes emerged from clustering 60 terms derived from individual and group interviews with targeted participants. Although some of the discovered themes previously existed in the Information Systems literature (e.g., UTAUT model constructs),

new themes were identified, such as Expectations, Sense of Community, and Cultural Values (Chapter 4 discussed the full list of themes and explained the discovery process).

Second, the field research found that the intention to use TMSP systems concerns functions of social influence, facilitating conditions, hedonic motivations, trust, a sense of community, and the cost of participation. This finding sheds light on an important issue related to the suitability of applying general technology acceptance models in different cultural contexts. Unlike UTAUT, where performance expectancy is the strongest predictor of technology acceptance, this study shows that performance and effort expectancy are not particularly relevant to the acceptance of TMSP systems in Saudi Arabia. It also highlights the importance of contextualized factors identified through deeper interviews with participants, such as Sense of Community.

Third, this study found different technology acceptance factors for different groups of users. In comparing the factors influencing the acceptance of TMSP systems among citizens who have used TMSP systems in the past and those who have not, the findings suggest that three factors are shared: social influence, facilitating conditions, and cost of participation. Moreover, the findings suggest that two factors will predict the usage intention of non-users only: sense of community and trust. Interestingly, one factor will predict the usage intention for citizens with prior use of TMSP systems: hedonic motivations. However, in contrast, it did not discover differences where they had been anticipated, for example, between men and women.

7.2   **Theoretical Contributions**

This dissertation has many contributions to Information Systems. First, the research fills an important gap in the technology acceptance literature. Most of the prior studies havefocused on technology acceptance from point of view of organizations trying to understand their potential user populations. However, this investigation focused on citizens' perspectives of technology acceptance. Unlike, say, a new accounting system, TMSP are discretionary use systems where personal motivation is critical.

Second, this research enriches the body of knowledge regarding technology acceptance and adoption by extending models to fit the less studied domain of TMSP. This work is the only one that focused on TMSP systems in general and incident reporting in particular. This class of information system has many unique characteristics that distinguish it from other more studied systems. It integrates many aspects from social media, such as crowdsourcing and gamification, but also data management and usage scenarios from public policy and e-government. It is clear that these types of systems will grow in importance around the globe and by deepening our understanding of them this model helps us better design and deploy them.

Third, this research presents anovel TMSP acceptance model . This model provides a better understanding of the motivational factors that impact the public's decision to accept and sustain community participation via TMSP systems.

Fourth, this research contributes to theory by examining the applicability of the UTAUT in non-Western contexts. In addition, it re-examines important variables derived from the literature, including trust, privacy issues, hedonic motivations, and cost of participation.

Fifth, this research also contributes to theory by examining how the UTAUT model is upheld when linked to different theories and models. In this dissertation, UTAUT was linked to the Expectancy Theory (Vroom, 1964) and the Sense of Community theory (McMillan & Chavis, 1986).

Finally, and most interestingly, this research contributes by extending the body of knowledge regarding the cultural impact of adopting TMSP systems in Saudi Arabia, which is currently limited. This dissertation's findings challenge the existing view that one model suits all cultures. This is disproven by showing that two of the strongest UTAUT constructs (PE, EE) are not supported in the context of Saudi Arabia. In the existing literature, there is little consideration to the cultural impact on citizens' technology acceptance. This study addresses this gap by incorporating cultural values into the proposed model.

7.3 Practical Implications

The lack of achieving critical mass is usually the main reason why many public participation initiatives fail, regardless of how many resources were invested in its success. This is due to the fact that users need to accept the technology in order to use. Critical mass should be ensured in the early stages of implementation, because early participants may well stop their participation before the critical mass of users is reached. Therefore, it is imperative to understand what makes these systems acceptable and socially usable. In terms of practical implications, this research will enable decision makers in Saudi Arabia who are responsible for civic engagement projects, as well as TMSP system developers and designers, to better understand the factors that can influence the acceptance and adoption of the TMSP systems they introduce.

As discussed, the study's findings suggest that Saudi policy makers should give greater attention to the sociocultural values that influence the decisions of technology acceptance. Technology is affected by the social context in which it develops; in their model, MacKenzie and Wajcman (1999) demonstrated that it is not the inner technical know-how that develops the technology, but instead the social factors and conditions of its creation and use.

In the present study, the qualitative findings confirm the conservative nature of Saudi society. In one sense this is reflected by gender segregation and female dependence upon male relatives for daily life needs. Despite this, female participants showed greater interest in accepting and using TMSP systems designed for the public good. This suggests that additional ways of raising TMSP awareness for females should be considered, such as promoting the existence and benefits of such systems. Moreover, among the study's participants, females in particular emphasized the importance of anonymity in reporting as a major factor of acceptance. Therefore, TMSP designers should address this by allowing user authentication procedures that ensure a balance of trusted authentication with anonymity.

In relation to culture, social influence should be taken into consideration; this study showed it to be one of the strongest predictors of usage intention. Collectivism characteristics and the tribal systems of Saudi society, as well as the manner in which interpersonal communications influence citizens' behavior, should be considered by policymakers. It has been suggested for the government to establish "role model" campaigns where an important and influential people in Saudi society are asked to spread awareness of a system and encourage its use. System designers should allow TMSP applications to be linked, and they should give citizens the option to share their non-sensitive reports in social media, which may serve as a

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channel of social influence. In regards to this matter, it is important to note that the Kingdom of Saudi Arabia has an overall quite young population, This indicates that the country is likely more socially and culturally dynamic than other countries around the world. Thus, these cultural values that were uncovered in this study may be in flux and necessitate revalidation in future studies.

Another practical implication of this research is derived from the significant affect that a sense of community has on influencing the acceptance of technology. The public will be incentivized by the perception of belonging to a community. Therefore, policy makers and government agencies should take advantage of this and use it to create TMSP systems that offer a sense of membership and influence to their users. TMSP systems designers should add gamification features, such as a scoring and ranking system, which could be seen by other participants. This would show the level of influence by each user. TMSP systems users should get points when they contribute information that leads to preventing a crime, solving a community issue, or safeguarding public property. Visibly acknowledging this contribution to the community may make contributors feel that they have gained some additional influence. This study's findings suggest that provoking this feeling of healthy competition (an aspect of hedonic motivation) may help attract a larger population of sustained and engaged TMSP system users.

The Expectation factor was strongly supported in the qualitative findings; however, it did not receive the same support in phase two of the research (see the discussion in chapter 6). Regardless, it is clear that users were motivated by the potential positive consequences of contributing to their communities via TMSP systems. Adding some gamification components, may make the value of their contribution seven more visible through community recognition.

Application notifications informing users that a community issue was solved by the contribution of a community member, without revealing the participant's identity, is another way for participants to understand their contributions. Providing feedback to the citizen and offering tracking features of their report will also influence citizens to accept and use TMSP systems. Needless to say, different citizens have different expectations and values regarding the outcomes of using TMSP systems, which makes it difficult for designers to accommodate all users' expectations.

Finally, as highlighted in the study, there are some differences in the factors that have a stronger effect on usage intention among early adaptors and non-users of TMSP systems. Trust is one of the factors that was supported for non-users; therefore, governmental agencies should create a trustworthy image of these systems before deploying the systems for general public.

7.4 Study Limitations

As with all research, this project had some limitations. First, due to the fact that this is one of the first studies to investigate technology acceptance for TMSP systems in the Kingdom of Saudi Arabia, there was not enough relevant literature to compare and contrast the present study's findings. In order to overcome this limitation, relevant literature such as citizen science systems and technology acceptance of e-government services in Saudi Arabia was consulted.

Second, during the data collection, this research used only one incident reporting system as an example of TMSP to introduce participants to the concept, as this was the only one available for Saudi citizens at that time. This likely had a the priming effect that impacted the perception of incident reporting systems in general. Most of the quotes used in this research finding concerned reporting violations by other humans. However, by the time of the survey, a second incident reporting system became available, with totally different purposes. It was added to the introductory scenario to help limit the bias caused by the emphasis on merchant reporting from first round of data collection.

Third, as is common for mixed methods research, there were tensions between quantitative and qualitative findings as explained in Chapter Six. The in-depth qualitative study revealed some important contextual factors that cannot be confirmed or validated via the use of survey research. Although a justification for the conflict through applying bracketing and bridging approach was provided, additional studies and investigations are required to elaborate on these disagreements.

Fourth, due to the difficulties of recruiting female participants for individual and group interviews, there was a gender imbalance with only 35% females in the qualitative phase.. This limitation was addressed by conducting two female-only focus groups. Moreover, an effort was made to ensure a balanced representation of gender in the quantitative phase of the research. This was accomplished, with 56.9% of the total number of participants being female.

Fifth, this study validated a model in a very unique culture context represented by the Kingdom of Saudi Arabia. This introduced a limitation on the generalizability of the study's findings for other population. However, this model could be valid for contexts that share similar sociocultural values, such as the neighboring Arabic/Muslim Gulf countries.

7.5 Future Research

The outcomes of this dissertation suggest several directions for future research. First, the present study examined the extended UTAUT model without testing the effect of its additional moderators. Investigating the influence of moderation effects of age, gender, and experience could enhance the findings of future studies.

Second, the proposed model of TMSP adoption presented in this study was validated with a single class of TMSP systems (incident reporting). There are several different domains, such as community policing, that future studies should explore to further mature and validate this model.

Third, future studies should conduct a third phase, returning from analysis of the survey to follow-up with additional qualitative data collection. In interpreting the results from the PLS-

SEM it was useful to return to the initial focus group and interview data to contextualize some of the findings. It would have been even more useful to do new interviews that targeted specific issues raised by the analysis. This would serve the goal of validating the final TMSP adoption model with deeper, contextual clarity.

Fourth, TMSP is a very particular and novel concept that comes from the intersection of human-centered computing, e-government, and social computing. It will be useful for future research to frame and situate TMSP systems within the design space of other classes of information systems.

In conclusion, technology acceptance models will enhance our understanding of the factors influencing user acceptance decisions when they are more culturally appropriate. There are countless research opportunities to contextually validate these models and get a better understanding of their acceptance prediction power.

Appendices

9.1 Appendix A: PHASE One: Focus Groups Questions in [Arabic]

الدراسة المبدئية : أسئلة مجموعات التركيز

<u>**السؤال الأول**</u> : بشكل سريع دعونا نتعرف على بعضنا. هل من الممكن أن يخبر كل فرد في المجموعة عن اسمه وعن اذا ما كان سبق له استخدام أحد تطبيقات المشاركة المتاحة للمواطنين في السعودية ؟

<u>**السؤال الثاني**</u> : أخبرني عن تجربة إما إيجابية أو سلبية حصلت لك خلال استخدام تطبيق المشاركة او التبليغ عن مخالفة في المملكة العربية السعودية ؟

<u>**السؤال الثالث**</u> : ما هي الأسباب التي دعتك لاستخدام وتجربة مثل هذا النوع من التطبيقات ؟

<u>**السؤال الرابع**</u> : دعونا الآن نسرد جميع الأسباب التي تمنع المواطنين السعوديين من استخدام مثل هذه الأدوات والتطبيقات المفيدة ؟

<u>**السؤال الخامس**</u> : والآن ماذا عن ترتيب أو التصويت على هذه الأسباب وراء المشاركة أو عدم المشاركة بهذه التطبيقات ؟

<u>**السؤال السادس**</u> : لنفترض أنك كنت شخص مسؤول و يمكن أن تغيير شيء واحد من شأنه أن يجعل الناس تقبل وتستخدم هذه الأدوات . ماذاستفعل ؟

<u>**السؤال السابع**</u> : هل ستشجع الآخرين على استخدام هذه الأدوات ؟ لماذا نعم أو لا ؟

<u>**السؤال الثامن**</u> : الى ماذا تفتقر أدوات المشاركة ؟ إذا كان لديك الفرصة لتصميم أحد هذه التطبيقات ما الذي ستغيره ؟ ماذا ستضيف وايضا ماذا ستزيل ؟

<u>**السؤال التاسع**</u> : استخدم ورقة صغيرة واكتب ثلاثة أشياء مهمة بالنسبة لك كي تشارك وتستخدم هذه التطبيقات بشكل أكبر ؟

<u>**السؤال العاشر**</u> : هل هناك أي شيء آخر ترغب في أن تخبرني به عن أدوات المشاركة المجتمعية ؟؟

9.2 Appendix B :Phase Two: Phase One: Individual Interviews Questions in [Arabic]

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المرحلة الأولى من الدراسة الأساسية : أسئلة المقابلات

السؤال الأول :
في نظرك أي نوع من الممارسات التي تصنف بأنها أحد ممارسات الغش أو المخالفات التجارية ؟ هل يمكن ان تعطيني بعض الأمثلة على المخالفات؟

السؤال الثاني :
أرجو أن تخبرني عن أي مخالفات واجهتها في مطعم أو أي من المحلات التجارية ، أو في أي مكان آخر ؟

إضافة للسؤال الثاني :
كيف تعاملت أنت او من معك مع هذه المخالفة ؟
(إذا كان الشخص لم يسبق له المرور بأي مخالفة فإنه يتم سؤاله عن اذا كان أحد من أصدقاءه أو أقاربه مرَ بمثل هذه التجربة؟)

السؤال الثالث :
من خلال تجاربك ومشاهداتك : هل هذه المخالفات تتكرر فقط في المملكة العربية السعودية ؟ أم أنه من الممكن التعرض لمثل هذا النوع من المخالفات في أماكن وبلدان أخرى ؟

السؤال الرابع:
في الوقت الراهن : هل تعتقد أن مخالفات المطاعم والمحلات التجارية في تزايد او تناقص ؟

السؤال الخامس :
في نظرك : ما هي العوامل التي تؤدي لوجود أو تناقص أو تزايد هذا النوع من المخالفات ؟

السؤال السادس :
في حالة تعرضت لمخالفة في أحد المطاعم او المحلات التجارية ماذا ستفعل ؟ وفي نظرك ماذا يجب على المواطنين أن يفعلوا وما هو التصرف الصحيح في مثل هذا الموقف ؟

إضافة للسؤال السادس :
ما هي الطريقة المثلى لايقاف وتقليل مثل هذا النوع من المخالفات ؟
ما هو الأسلوب الأفضل لتبليغ الجهه الحكومية عن مثل هذه المخالفات .
في حالة تعرضت لمخالفة .. ما الذي ستفعله لضمان عدم حصولها مرة أخرى سواء لك أو لغيرك

السؤال السابع:
من فضلك أخبرني ماذا تعريف عن تطبيق بلاغ تجاري ؟

اضافة للسؤال السابع :
اذا كان الشخص لم يسمع بتطبيق بلاغ تجاري من قبل فأعطه هذا الشرح الموجز (هو تطبيق للهواتف الذكية قامت بتطويره وزارة التجارة والصناعة في المملكة العربية السعودية للتبليغ عن المخالفات التي يواجهها العميل في المطاعم والمحلات التجارية من خلال اخذ صورة للمخالفة والابلاغ عن نوعها ومكان وتوقيت حدوثها). ثم اعرض عليه ان اراد أن يأخذ نظرة سريعة على التطبيق من خلال الجوال .

السؤال الثامن :
في حالة كان الشخص لم يسمع بتطبيق بلاغ تجاري من قبل هذه المقابلة فاطرح عليه الاسئلة التالية :
بناء على ما رأيت او تعلمت قبل قليل عن هذا التطبيق هل ستقوم بتحميله على هاتفك ؟ هل ستستخدمه ؟ او تنصح أحد باستخدامه؟
اذا كانت الاجابة على السؤال السابق بنعم فأضف هذا السؤال:
ما الذي يجعلك ترغب في استخدام هذا التطبيق ؟ (بإمكانك طرح اسئلة اضافيه حول العوامل المحفزة لاستخدام هذا التطبيق مثل مفهوم الفعالية / سهولة الاستخدام / الفائدة والمنفعة / التأثير الاجتماعي).
في حالة كانت الاجابة على السؤال الثامن بلا : فأضف هذا السؤال :
ما الأسباب التي تدفعك لعدم استخدام هذا التطبيق ؟ (بإمكانك طرح اسئلة اضافيه حول العوامل المحفزة لاستخدام هذا التطبيق مثل مفهوم الفعالية / سهولة الاستخدام / الفائدة والمنفعة / التأثير الاجتماعي).

السؤال التاسع :
اذا كان الشخص يعرف او سمع بتطبيق بلاغ تجاري قبل اجراء هذه المقابلة لكنه لا يستخدمه فاطرح عليه السؤال التالي :

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لماذا لم تستخدم هذا التطبيق على الرغم من انك تعرفه ؟ (بإمكانك طرح اسئله اضافيه حول العوامل المحفزة لاستخدام هذا التطبيق مثل مفهوم الفعالية / سهولة الاستخدام / الفائدة والمنفعة / التأثير الاجتماعي).

السؤال العاشر :

اذا كان هذا الشخص يعرف هذا التطبيق وسبق له استخدامه فاطرح عليه مجموعة الاسئلة التالية :

لماذا قمت بتحميله واستخدامه ؟ (بإمكانك طرح اسئلة اضافيه حول العوامل المحفزة لاستخدام هذا التطبيق مثل مفهوم الفعالية / سهولة الاستخدام / الفائدة والمنفعة / التأثير الاجتماعي).

هل كان تطبيق بلاغ تجاري سهل الاستخدام ؟ اوصف لي تجربتك باستخدام التطبيق ؟

هل نصحت أحد ممن تعرف باستخدامه ؟

هل ترى ان هذا التطبيق مفيد ؟ هل تواصل معك أحد بعد ابلاغك عن مخالفة ؟

ما الذي سيجعلك تتوقف عن استخدام تطبيق بلاغ تجاري : اذكر لي جميع الأسباب ؟

هل ستقوم بالتبليغ عن مخالفة عندما تكون عميلا دائما لهذا المطعم او المحل التجاري المخالف ؟

السؤال الحادي عشر :

اوصف لي تجربتك بشكل عام ؟ تقنيا ومن ناحية التصميم تحديداً ؟

السؤال الثاني عشر :

هل ترغب وتدعم انتشار مثل هذه التطبيقات ؟

السؤال الثالث عشر :

برأيك ما هي المنظمات والخدمات التي يجب أن توفر مثل هذا التطبيق ؟

السؤال الرابع عشر :

هل تؤمن بوجود عقبات تسهم في تعثر وانتشار مثل هذا النوع من التطبيقات في المملكة العربية السعودية ؟ ما هي ؟ (بإمكانك طرح اسئلة اضافيه حول العوامل المحفزة لاستخدام هذا التطبيق مثل مفهوم الفعالية / سهولة الاستخدام / الفائدة والمنفعة / التأثير الاجتماعي).

السؤال الخامس عشر :

هل من كلمة أخير تود طرحها حول تطبيق بلاغ تجاري خصوصا أو أي أحد تطبيق المشاركة المجتمعية عموما ؟

9.3 Appendix C :Phase Two: Survey questions in [Arabic]

العنصر	السؤال	الإجابة
	المتغيرات الديموغرافية	
1	ما هو جنسك ؟	ذكر أنثى
2	هل أنت مواطن سعودي ؟	نعم لا
3	كم عمرك؟	18-24 25-30 31-40 41-50 51-60 61-69 70 أو أكبر
4	ما هي وظيفتك ؟	غير موظف موظف حكومي موظف قطاع خاص طالب
5	هل تملك هاتف جوال ذكي ؟	نعم لا
6	أيٌّ من الخيارين التاليين يصف المكان الذي تعيش فيه؟	منطقة مدنية حضرية منطقة قروية ريفية
7	في أي المناطق تعيش ؟	الوسطى الشرقية الجنوبية الغربية الشمالية خارج المملكة
8	هل سبق لك استخدام أحد تطبيقات التبليغ عبر الجوال؟	نعم لا
9	كم عدد تطبيقات التبليغ التي سبق لك استخدامها؟	لم أستخدم في السابق 1 2-4 5 وأكثر

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غير موافق بشدة	غير موافق	غير موافق الى حد ما	محايد	موافق نوعاً ما	موافق بشدة	السؤال	
						أعتقد أن تطبيقات الجوال مفيدة للتبليغ عن المخالفات.	PE1
						استخدام تطبيقات التبليغ بواسطة الجوال سوف يمكني من التبليغ عن المخالفات بشكل أسرع.	PE2
						استخدام تطبيقات للجوال للابلاغ عن مخالفات سيزيد من فعالية مشاركتي في بناء المجتمع.	PE3
						اعتقد ان استخدام تطبيقات الجوال للتبليغ عن المخالفات سيؤدي الى حل المشكلة المبلغ عنها.	PE4
						التعامل مع واجهات مستخدم تطبيقات التبليغ بواسطة الجوال سيكون واضح.	EE1
						سيكون من السهل التبليغ عن مخالفة باستخدام تطبيقات الجوال.	EE2
						اعتقد أن استخدام تطبيقات الابلاغ عن مخالفات أمر سهل.	EE3
						تعلم كيفية ارسال البلاغ سيكون أمراً سهلاً.	EE4
						الأشخاص الذين لهم تأثير على سلوكي يعتقدون انه يتوجب علي استخدام تطبيقات التبليغ عن مخالفة.	SI1
						الاشخاص المهمين في حياتي يعتقدون انه يجب علي استخدام تطبيقات التبليغ عن مخالفة.	SI2
						سأستخدم تطبيقات التبليغ عن مخالفات لأن أصدقائي يستخدمونها.	SI3
						انا أمتلك هاتف ذكي مما يمكنني من ستخدام تطبيقات التبليغ.	FC1
						لدي المعرفة الكافية لاستخدام تطبيقات التبليغ عن مخالفات.	FC2
						أستطيع تحميل تطبيقات التبليغ عن مخالفات على هاتفي لاستخدامها.	FC3
						أنا أنوي استخدام تطبيقات التبليغ عن مخالفات قريباً.	UI1
						أتوقع أنني سأستخدم تطبيقات التبليغ عن مخالفات في المستقبل القريب.	UI2
						انا اخطط لاستخدام تطبيقات التبليغ عن مخالفات قريباً.	UI3
						أشعر بالقلق من اساءة استخدام معلوماتي الشخصية عندما استخدم تطبيقات الابلاغ عن مخالفات .	PI1
						الابلاغ عن مخالفة دون الكشف عن هوية المبلِّغ أحد الخصائص المهمة لمثل هذه التطبيقات.	PI2
						اشعر بالقلق من تزويد الجهات الحكومية بمعلوماتي الشخصية عند استخدام هذه التطبيقات.	PI3
						اشعر بالقلق لعدم وجود قانون يحمي معلوماتي الشخصية من التسريب عند الابلاغ باستخدام هذه التطبيقات.	PI4
						تطبيقات التبليغ عن مخالفات موثوقة .	T1
						انا على ثقة بأن الجهات الحكومية ستتعامل مع بلاغي بكل شفافية.	T2
						أنا على ثقة بأن الجهات الحكومية تتقبل النقد .	T3

							سأقوم باستخدام تطبيقات التبليغ عن مخالفات بغض النظر عن تكلفة استخدامها	PC1
							سأقوم باستخدام تطبيقات التبليغ عن مخالفات عندما تكون مجانية فقط.	PC2
							تطبيقات التبليغ عن مخالفات ستضيع وقتي.	PC3
							المشاركة في بناء واصلاح المجتمع من خلال المشاركة في تطبيقات التبليغ عن مخالفات يستحق جزءً من وقتي.	PC4
							استخدام تطبيقات التبليغ عن مخالفات ممتع.	HM1
							استخدام تطبيقات الابلاغ عن مخالفات أمر ممل.	HM2
							استخدام تطبيقات التبليغ عن مخالفات أمر مسلّي.	HM3
							أتصور انني سأحصل على مكافأة عندما ابّلغ عن مخالفة.	E1
							أتصور ان الحكومة يقدّرون لي استخدامي لتطبيقات التبلغ عن مخالفات.	E2
							أشعر بالرضا والسعادة عندما يقدّر الآخرين استخدامي لتطبيقات الابلاغ عن مخالفات.	E3
							تقدير الحكومة لي سيؤثر على قراري للابلاغ عن مخالفات من عدمه.	E4
							تقدير الحكومة لمشاركتي وبلاغاتي أكثر قيمة من أي مكافأة أخرى.	E5
							أشعر بالرضا والسعادة عندما تعترف الحكومة بأني مواطن صالح.	E6
							سأستخدم تطبيقات التبليغ عن مخالفات عندما تدفع لي الحكومة مقابلاً لبلاغاتي	E7
							سأستخدم تطبيقات الابلاغ عن مخالفات مجانا و دون مقابل.	E8
							المكافأة بالمال أهم عندي من أي مكافأة اخرى لاستخدام تطبيقات التبليغ.	E9
							سأستخدم تطبيقات التبليغ اذا كانت الجهة المسؤولة ستتجاوب مع بلاغي.	E10
							اتصور أن المنظمات المسؤولة سوف تتجاوب مع بلاغاتي.	E11
							سأستخدم تطبيقات الابلاغ عن مخالفات فقط عندما أكون متأكد تماماً أنه سيترتب على بلاغي فائدة مرجوّة.	E12
							أعتقد أن تطبيقات التبليغ عن مخالفات مفيدة لكل أفراد المجتمع.	E13
							التبليغ عن المخالفات باستخدام تطبيقات هو أحد انواع الصدقة والإحسان.	E14
							التبليغ عن المخالفات هو نوع من رد الجميل للمجتمع .	E15
							معاملة البلاغ بعد ارساله هي أحد الخصائص المهمة في تطبيقات متابعة سير الابلاغ.	E16
							الحصول على تقرير حول البلاغ بعد تسليمه وحل المشكلة أمر مهم بالنسبة لي.	E17
							اذا كنت لا استطيع معرفة نتيجة بلاغي فإني لن استخدم تطبيقات التبليغ عن مخالفات مرة أخرى.	E18
							سأستخدم تطبيقات التبليغ اذا كان ذلك يساعد في حل المشكلة.	E19
							استخدام تطبيقات التبليغ سيجعل حل مشاكل المجتمع يتم بصورة أسهل.	E20
							مشاهدة نتائج ايجابية لبلاغاتي يشعرني بالانجاز.	E21

								سأستخدم تطبيقات الابلاغ لأني أشعر بالضجر من المخالفات.	E22
								مخالفة القوانين تشعرني بالغضب	E23
								أشعر بالسعادة لانتمائي للمجتمع السعودي.	SC1
								أعتقد أن استخدام تطبيقات التبليغ يجعل مني مواطناً أفضل	SC2
								استخدام تطبيقات التبليغ سيزيد من شعوري بالانتماء لمجتمعي	SC3
								استخدام تطبيقات التبليغ سيسهم في عملية التغيير الايجابي في مجتمعي.	SC4
								تطبيقات التبليغ ستساعدني على ترك أثر ايجابي في المجتمع.	SC5
								يهمني ما يحصل ويحدث في مجتمعي .	SC6
								تطبيقات التبليغ ستزيد من نجاح الحكومة في تحقيق متطلبات المواطنين.	SC7
								أعتقد أن استخدام تطبيقات التبليغ تساعدني في الحصول على ما أريده من المنظمات والجهات الحكومية.	SC8
								أشعر بالرضى عندما تستجيب الجهة الحكومية لبلاغي.	SC9
								أعتقد أن المنظمات الحكومية ستتجاهل بلاغي.	CV1
								استخدام تطبيقات التبليغ لن يحل المشكلة.	CV2
								استخدام تطبيقات التبليغ سيجعل منا مجتمعاً أفضل.	CV3
								سأبلغ عن مخالفة أو مشكلة حتى لو كانت متعلقة بأحد معارفي .	CV4
								سأبلغ عن المخالفين بغض النظر عن هويتهم او علاقتهم بي.	CV5
								سأبلغ عن أفراد عائلتي واصدقائي اذا خالفوا القوانين.	CV6
								استخدام تطبيقات التبليغ لا يتعارض مع معتقداتي الدينية.	CV7
								أعتقد أنني أؤجر على استخدامي لتطبيقات التبليغ.	CV8
								تجاهل المخالفات والعفو عن المخالفين أفضل من استخدام تطبيقات التبليغ للابلاغ عن المخالفات .	CV9
								أتصور أن النساء سيستخدمون تطبيقات التبليغ أكثر من الرجال.	CV10
								الرجال والنساء السعوديات سيستخدمون تطبيقات التبليغ لنفس الأسباب.	CV11
								أعتقد أن الرجال سيستخدمون تطبيقات التبليغ أكثر من النساء.	CV12
								أعتقد أن معدل استخدام النساء والرجال للتطبيقات واحد.	CV13
								الجهات الحكومية ستتفاعل مع بلاغات الرجال أكثر من النساء.	Cv14

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9.4   Appendix D: IRB Documents

Date: October 19, 2015

To: Fahad Alayed
           Dr.Wayne Lutters

Re: Notice of Action
           Protocol # : Y14WL12073
           Original approval date: November 21, 2013
           Modifications submitted: October 16, 2015

Your request for approval of changes made to the documents for your protocol entitled Citizen Adoption Model for Technology Mediated Social Participation Systemshas been **approved** by the Chair of the Institutional Review Board.This research was previously reviewed and approved by the IRB, where no greater than minimal risks to participants and no additional risks were identified.

Note that all other conditions and investigator responsibilities outlined in the original approval letter are still in force.

Whom to Contact about this study:
Principal Investigator: Fahad Alayed ,Dr.Wayne Lutters
Department: Information Systems
Telephone number: 410-227-7781, 410-455-3941

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES
Barriers and Motivations for User Acceptance of Public Participation Technologies

I.   **INTRODUCTION/PURPOSE:**
        I am being asked to participate in a research study. The purpose of this study
        is to explore the factors that motivate the acceptance of public participation
        technologies that are designed for the community's involvement and
        engagement in Saudi Arabia. I am being asked to volunteer because I am a
        Saudi citizen. My involvement in this study will begin when I agree to
        participate and will continue until the completion of the study or December
        2015. About 30 persons will be invited to participate.

II.   **PROCEDURES:**
        As a participant in this study, I will be asked to participate in a Focus Group
        session and / or one-to-one interview with the researcher. I will be asked to
        come to mutually convenient location. My participation in this study will last
        for approximately forty-five minutes. I give the researchers the permission to
        record the interview for transcription. I also give the researchers the authority
        to take pictures for documentation . I also have been informed that no personal
        identifying information will be attached with my responses.

III.   **RISKS AND BENEFITS:**
        My participation in this study does not involve any significant risks and I have
        been informed that my participation in this research will not benefit me
        personally, but may help better understand the motivations and barriers of
        participation and engagement tools acceptance of Saudi citizens .

IV.   **CONFIDENTIALITY:**
        Any information learned and collected from this study in which I might be
        identified will remain confidential and will be disclosed ONLY if I give
        permission. The investigator (s) will attempt to keep my personal information

Y14WL12073 consent

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confidential. To help protect my confidentiality,all digital notes, transcripts of focus groups and interviews and other digital material will be stored on the researcher personal and lab computers (which are password-protected). Original digital tapes will be stored on a thumb drive that will be locked in file cabinet in the researcher home. Non-digital evidence will be stored in a locked file-cabinet in the researcher home.

Only the investigator and members of the research team will have access to these records. If information learned from this study is published, I will not be identified by name. By signing this form, however, I allow the research study investigator to make my records available to the University of Maryland Baltimore County (UMBC) Institutional Review Board (IRB) and regulatory agencies as required to do so by law.

Consenting to participate in this research also indicates my agreement that all information collected from me individually may be used by current and future researchers in such a fashion that my personal identity will be protected. Such use will include sharing anonymous information with other researchers for checking the accuracy of study findings and for future approved research that has the potential for improving human knowledge.

 (1) my name will not be included on the surveys and other collected data; (2) a code will be placed on the survey and other collected data; (3) through the use of an identification key, the researcher will be able to link my survey to my identity; and (4) only the researcher will have access to the identification key.

  I give permission to record my voice or image and use in scientific publications or presentations.

  I do not give permission to record use my voice or image and use in scientific publications or presentations.

V.   **COMPENSATION/COSTS:**
My participation in this study will involve no cost to me. I will be compensated with $10 for my participation .

Y14WL12073 consent

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VI.   CONTACTS AND QUESTIONS:

The principal investigator(s), Fahad Alayed has offered to and has answered any and all questions regarding my participation in this research study. If I have any further questions, I can contact Fahad Alayed   at 410-227-7781 ,f.alayed@umbc.edu or Dr. Wayne Lutters,
410-455-394, Lutters@umbc.edu
If I have any questions about my rights as a participant in this research study, contact the Office for Research Protections and Compliance at (410) 455-2737 or
compliance@umbc.edu.

VII.   VOLUNTARY PARTICIPATION

I have been informed that my participation in this research study is voluntary and that I am free to withdraw or discontinue participation at any time. I have been informed that data collected for this study will be retained by the investigator and analyzed even if I choose to withdraw from the research. If I do choose to withdraw, the investigator and I have discussed my withdrawal and the investigator may use my information up to the time I decide to withdraw.

I will be given a copy of this consent form to keep.

VIII. SIGNATURE FOR CONSENT

The above-named investigator has answered my questions and I agree to be a research participant in this study.

Participant's Name: _____   Date: _____

Participant's Signature: _____   Date: _____

Investigator's Signature: _____   Date: _____
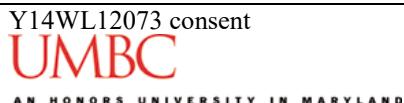
Y14WL12073 consent

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VERBAL CONSENT DOCUMENTATION FOR PARTICIPATION.

SUBJECT: ***Barriers and Motivations of User Acceptance of Public Participation Technologies .***

This consent serves as documentation that the required elements of informed consent have been presented orally to the participant or the participant's legally authorized representative by using the below telephone consent script.

Verbal consent to participate in this telephone survey has been obtained by the below investigator on the below date documenting the participant's willingness to continue with the telephone survey.

_____
Investigator's Name (Printed)

_____
Investigator's Signature

_____
Date

HELLO

Thanks for your interest in participating in our study --I am Fahad Alayed a PhD student in Information System department at the University of Maryland, Baltimore County. We are conducting this research to explore the factors that motivate the acceptance of public participation technologies that are designed for the community involvement in Saudi Arabia. Our finding will help better understand the motivations and barriers of participation and engagement technologies acceptance of Saudi citizens.

You are being contacted because I would like to ask you questions about your understanding of participations tools and the reasons behind using them. If you agree, then the interview should take approximately 30-50 minutes. Your response will remain completely confidential and will never be revealed to others. For our study, the information from multiple participants will be aggregated for analysis and reporting. We would like to tape-record the interview (so that we can better recall what you have said) and to take written notes (The digital recordings will be destroyed after they are transcribed).

Do you have any questions about the research project? I will be documenting your consent to participate. May I proceed with the first question?

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