

Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling Approach

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Abstract - The advancement in mobile technologies has influenced many countries to adopt mobile services in their private and public organizations including Oman. M-commerce services are growing rapidly with the exponential growth of mobile devices, technologies and networks. Hence, many business organizations private or public use them to improve revenue, reduce costs, maintain their competitive edge and achieve a level of high efficiency. Although there were many M-commerce services introduced, it was hard to find evidence of any study conducted to determine their successes or failures. This study is an attempt to explore the factors affecting the adoption of M-commerce services in Oman using the Technology Acceptance Model (TAM) approach.

Keywords - M-commerce services, Mobile technology, TAM, Oman

1. Introduction

Today's fast pace world demands efficient modern technology to enhance productivity in our personal or business life. This trend of existence has revolutionized our traditional commerce to electronic commerce known as E-commerce. The term E-commerce is the process of buying and selling goods, products and services over electronic systems such as the Internet [1]. With the exponential growth of mobile device technologies and wireless networks, a new version of E-commerce has taken shape. It has continuously gained popularity and is now known as Mobile commerce. Mobile commerce or M-commerce is a subset of E-commerce and has been in implementation for quite some time while M-commerce services are still relatively new. Both of these kinds of services have different requirements but the basic aim is the same which is to facilitate the business process for users much more rapidly and efficient [2].

M-commerce, much like its E-commerce counterpart, also has the process of buying and

selling products through wireless handheld devices such as smart phone, tablets and even PDAs. Compared to M-commerce, E-commerce has constrains as it requires the use of a computer and an internet connection, whereas mobile devices work on technical standard known as Wireless Application Protocol (WAP) [3]. This allows users to connect to the internet without the need of any desktop or laptop computer. M-commerce however is costly compared to E-commerce for roaming as wireless internet charges progressively increase[4]. In any household, a computer is typically shared while mobile devices are considered to be extremely personal possessions thus increasing the number of mobile users. In a recent survey in Oman, 80% of computer users have access to the internet through the use of a computer, whereas only 91% have access to the internet through their mobile devices[4].

M-commerce allows businesses to reach its clientele on the go as compared to E-commerce, which requires having a computer available. M-commerce allows users to carry out financial transactions, bill payments, buying tickets, transferring funds, ordering products and receiving messages from private or public organizations [5]. More and more mobile applications are making their way into the marketplace and will soon be available for widespread use. These qualities have made M-commerce instantly popular among all ages of the society [6].

Background to the study

The Sultanate of Oman is located on the south east of the Arabian Peninsula and is an important member of the Gulf Cooperation Council (GCC) countries. According to (National Centre for Statistics and Information-NCSI, 2014), the latest estimates Oman had a population of 4 million people. A total of 2,232,949 Omanis were recorded, while expatriates comprised 44.2 percent of the total population with 1,767,396. Oman's currency is the

Rial which is equivalent to \$2.60 USD to one Omani Rial [7]. Oman is one of the world's biggest oil producing countries and oil and natural gas extraction account for 51 percent of the country's GDP. The country's economic status was substantially enhanced by rising oil prices. According to (Trading Economics Oman GDP, 2013), Oman's 2013GDP reached about OMR 80.57 billion, compared to OMR 104 million in 1970 [8]. Sultanate of Oman enjoys a stable political, economical and social system under the leadership of SultanQaboos and achieved a remarkable progress in both economical and social fields [9].

Overview of ICT in Oman

Recently, the Sultanate of Oman has introduced the country's digital strategy to promote e-Oman as a state-of-the-art solution in implementing the new initiatives. It has embarked on several projects, the most important being: streamlining government services to citizens, residents and public and private sectors businesses as well. Yet, despite the governments' growing investment in electronic services sector, the commitment to educating users by offering training programs and awareness campaigns makes citizens reluctant to adopt e-Services due to a lack of trust in the security of online business transactions [10].

According to (Global Information Technology Readiness Report-GITR, 2014), Oman has retained its competitiveness position as 40th in the world in technological readiness, which showed that countries with a strong vision to develop their Information and Communications Technology (ICT) capacity have a dominant economic presence [11]. The report also shows 62.7% of Omani households have access to a personal computer with 60% using the internet. Oman ranks 12th in the world for government procurement of advanced technology, 13th in the importance of ICT in the government's vision and 15th in government success in ICT promotion shows. The report indicates that private sector investment in ICT is increasing as Oman ranks 14th in the world for available venture capital [11].

Overview of M-commerce services

M-commerce services, according to (Turban & Volition, 2010), have two distinguished characteristics like mobility and broad reach. M-commerce services are based on the fact that users carry mobile devices any where they go and users can be reached at any time. We get additional attributes such as ubiquity, convenience, instant connectivity, personalization, localization of products and services [2]. Mobile devices create an

opportunity to deliver new services to existing customers and to attract new ones. Oman has capitalized these opportunities and started offering many new M-services[12].

The following section outlines the major M-commerce services offered in Oman are categorized in two groups; Push and Pull services. Push services are passive in nature where clients or end-users usually receive notifications about certain activities or events. On the contrary, Pull services ask users to play a more active role in either initiating the service or responding to queries via SMS using mobile devices.

M-commerce Pull Services

There are many M-commerce Pull services have initiated in Oman including The Royal Oman Police (ROP) traffic violation offences where the service allowing the drivers to inquire and receive information about their traffic offences. The drivers may know the fines and payment can be made [13].

The Ministry of Education in Oman have recently started the mobile commerce service to send the final general certificate results to students via SMSs. Alternatively, students can inquire about their results by messaging their seat numbers to '92020' and receive their final grades. In addition, the Higher Education Admission Center now informs students of their admission status in different institutions via SMSs allowing them to accept or reject the offer by messaging back their choices [13], [14].

Muscat Municipality and Oman mobile have introduced a new M-commerce service for paying the parking fee in their business district and its surrounding areas. The motorist can pay the parking fee through an SMS service and get the alert for expiry of the time and additional parking time can also be requested and payment could be made for the additional time[13], [14].

M-commerce Push Services

Besides Pull Services, Oman is also offering many M-commerce Push services such as Muscat Securities Market which now provide investors to receive updates on market and stock alerts via SMS [13]. The service also enables users to get a SMS every 30 minutes on market movers - top winners, losers and most active companies.

The Meteorology and the Civil Aviation departments with Oman Mobile cooperation have introduced a weather forecast service for most towns in Oman that allows users to receive weather reports on their mobiles [14].

Most banks in Oman are now offering M-commerce services to their clients where they can receive updates on their bank accounts activities for amount deposits and draws out of their accounts[15].

Major shopping Malls in Oman are now utilizing M-commerce services by sending their ads and promotional incentives to the local clients via SMSs. Many other organizations have also started to send bulk messages to clients informing them about their activities and events via SMS to all residents in Oman.

Several barriers have been attributed to the slow adoption of e/m-commerce in Oman. For example, (Zhu and Thatcher, 2010), argue that the lack of government support is a major issue to this slow adoption [16]. Other factors like trust-related issues, ICT infrastructure and IT skills were also highlighted in the literature [17]. This led to a question what reasons are behind the users' lack of enthusiasm in using M-commerce services and what Oman can do to win their trust in the bid to ensure the success of the country's shift to a digital era. If the causes are technical, then what is wrong with Oman's digital strategy even that could not motivate the people to adopt these services offered in the country [18]. It appears that the barriers are not entirely technical.

Several studies are done on mobile banking, mobile commerce and e-government, but hard to find any M-commerce adoption framework on the issues related to slow adoption of M-commerce in Oman [15], [19], [20].

This study is an attempt to investigate the reasons and to identify the factors which are serving

as irritants in swift adoption of M-commerce services offered by private and public organizations of Oman. This paper explores the factors affecting the adoption of M-commerce services in the light of Technology Acceptance Model as briefly described in the following section.

Technology Acceptance Model

The Technology Acceptance Model (TAM) was introduced and developed by Fred Davis in 1986. TAM is a model derived from a theory that addresses the issue of how users come to accept and use specific technology [21]. (See Figure 1)

The model suggests that when users are offered or presented a new system or software package a number of variables influence their decisions about how and when they will use it, specifically perceived and usefulness variables [21]. TAM is designed to apply only to computer usage behavior, but it can be readily extended to apply to any other type of technology to study its users' acceptance or adoption.

Perceived usefulness and Perceived ease of use are the two major determinants of users' attitudes which lead to users' intention to the actual technology usage. The usage if not corresponding to the attitudes then the irritants is needed to be explored, which is studied and presented in this paper. This model (Figure 1) is used in to examine the users' attitudes and their adoption of M-services and study the factors which are contributing to the slow or serving as irritants in the adoption of the M-commerce services in Oman.

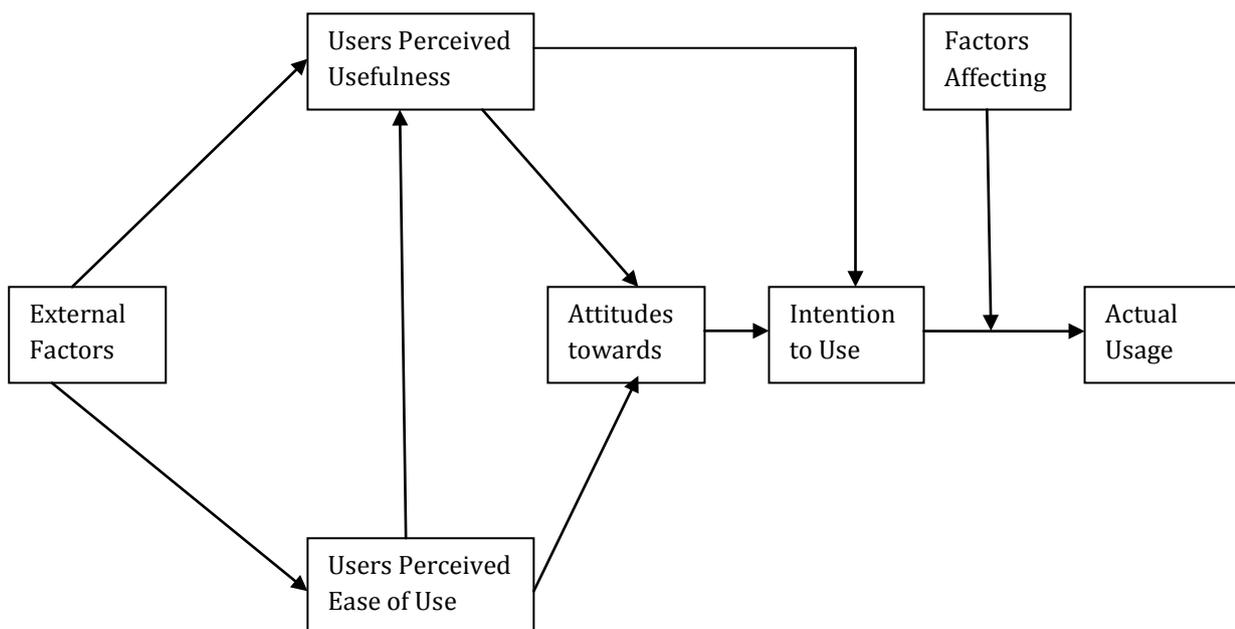


Figure 1. Technology Acceptance Model M-Commerce Adoption

2. Research Methodology

A questionnaire survey was developed to collect the data on accessibility of the M-commerce services, users' attitudes towards these services, security, privacy, trust and their preference on using these services over the traditional modes. The confidentiality of the respondents was maintained and no identification were requested from them in the survey.

The responses to each question were based on a scale of 1 to 5, where 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree. The questionnaire was administered in the same way to all and only the questionnaires which were responded and filled up completely were taken into consideration.

This questionnaire survey instrument was used to collect data from M-commerce services users or its potential users between the ages of 18 to 25 years. The data was collected in year 2013 and 2014 from 89 respondents of which 61% were male and 39%

female. A simple analysis was conducted through computing and comparing the percentages of the users' responses.

3. Data Analysis and Results

Accessing M-commerce service: The feedback on accessing the Pull Mobile services by users indicated that 87% of the total 89 users responded in agreement that M-commerce services are accessible at any time of the day with comfort. However near about 16% disagree as shown in Figure 2. As we know the Mobile services depend on the network availability, signal strength and moreover they have regional scope. Hence the reasons for not accessing the M-commerce services could be either technical or the users' inability to correctly following the procedure to initiate the services. The service providers are continuously improving and putting their efforts to provide mobile services efficiently and effectively from all regions of the country.

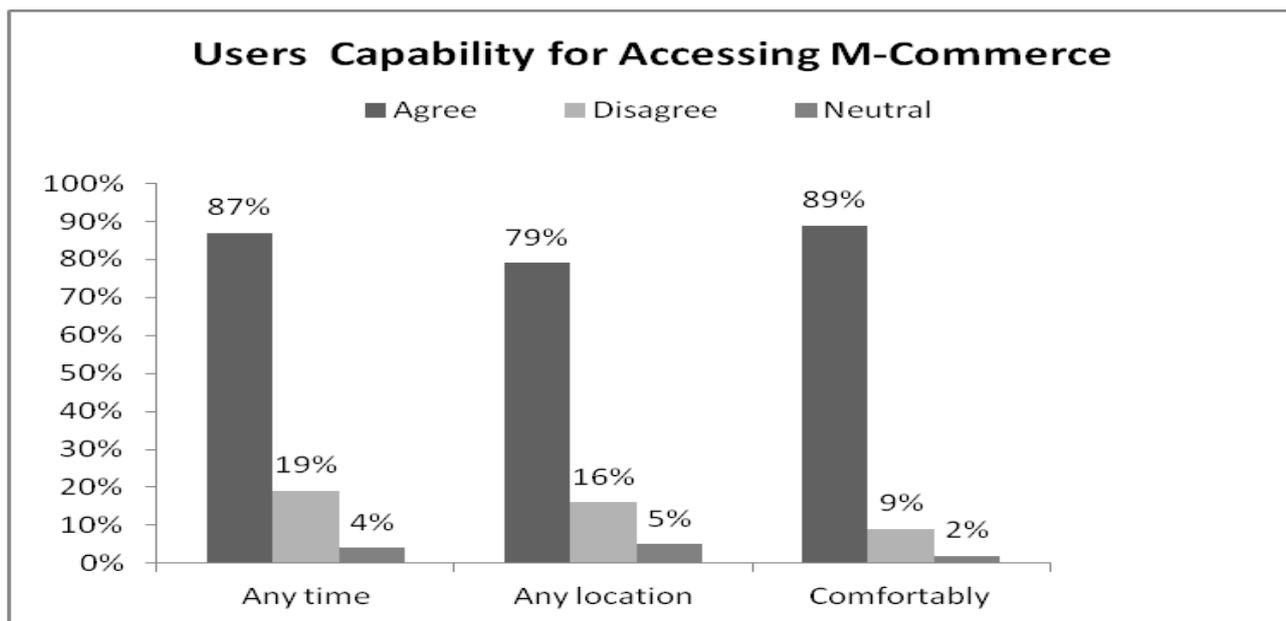


Figure 2. Accessing M-Service/s

Attitudes towards M-commerce Service adoption:

There were five questions on attitudes to investigate the users' feedback on M-commerce services in the country. Figure 3 shows that more than fifty percent of the users have positive attitudes

toward the services offered. They consider the services are easy to use and fast. They are friendly and the users feel at ease while using them it. The most users like 68% have recognized that the M-commerce services are very useful and similar number of respondents feels as they are easy to use.

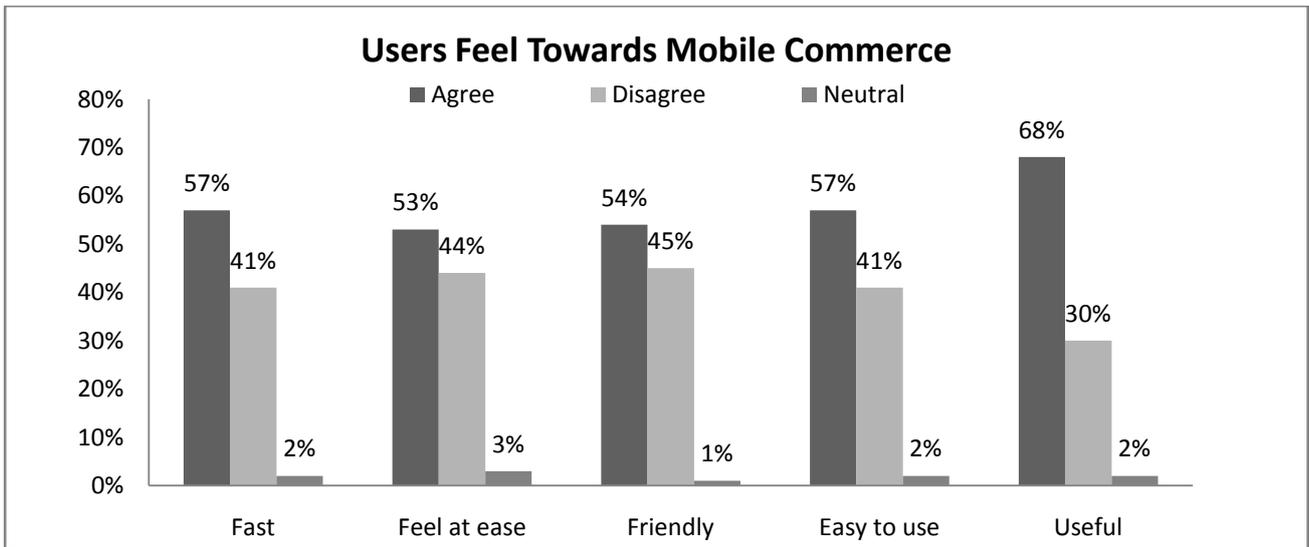


Figure 3. Users feeling towards M-Commerce

According to TAM the users' perceived usefulness and the ease of use of these services should motivate the users to its usage and in turn to more adoption of these services. But this is not as shown in Figure 4, where only 26% have indicated their preference in using M-commerce services while

70% have no intention to use these services. It appears that there are some inhibiting factors which are very much dominating in the usage of M-commerce services like security, privacy and trust deficit on business transaction conducted wired or wireless media.

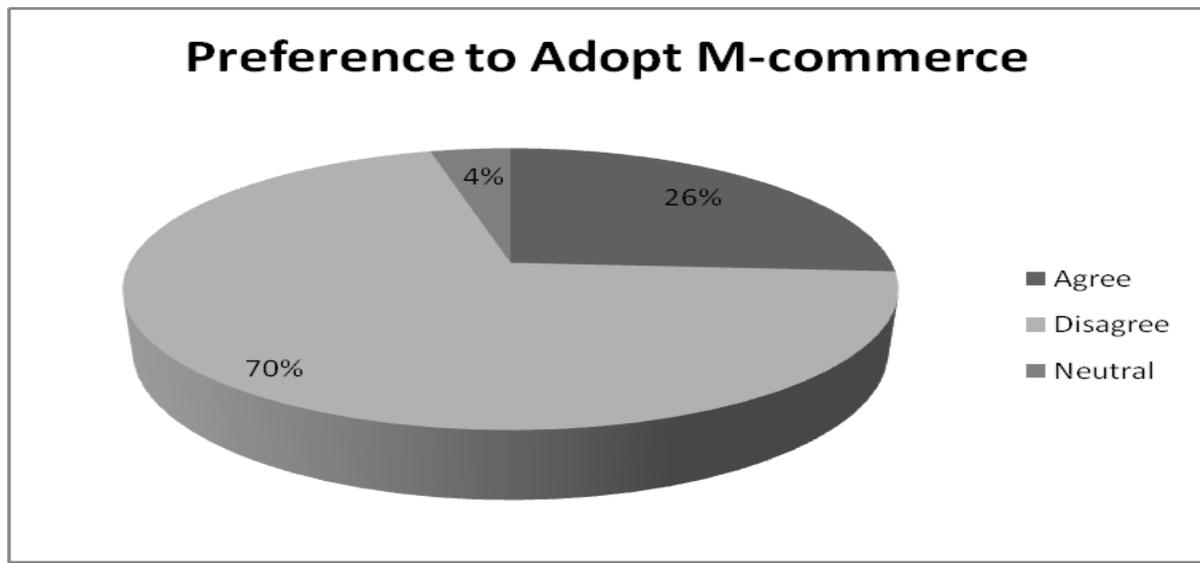


Figure 4. Users Preference adopting M-commerce Vs. Traditional mode

Factors to M-commerce services Adoption:

Security of online transactions is a major concern worldwide and Oman is not an exception [9]. Security basically offers a degree of protection against criminal activity, danger, and/or loss of business transactions [22]. It is now more difficult to secure organizational information resources because of:

- Today's interconnected, interdependent, wirelessly networked business environment
- Smaller, faster, cheaper computers and storage devices
- Decreasing skills necessary to be a computer hacker
- International organized crime taking over cybercrime
- Lack of management support

Figure 5 shows that a large number of respondents 71% have concerns related to the security of business transactions which appears as one of the major factor in adoption M-commerce in the country.

A similar number of respondents 75% have mentioned their concerns over the privacy of

business transactions. In general privacy is the right to be left alone and to be free of unreasonable personal intrusions [1]. Threats to privacy are easily violated when information are held in databases or transmitted over the networks, which is very much alarming to business organizations using M-commerce services.

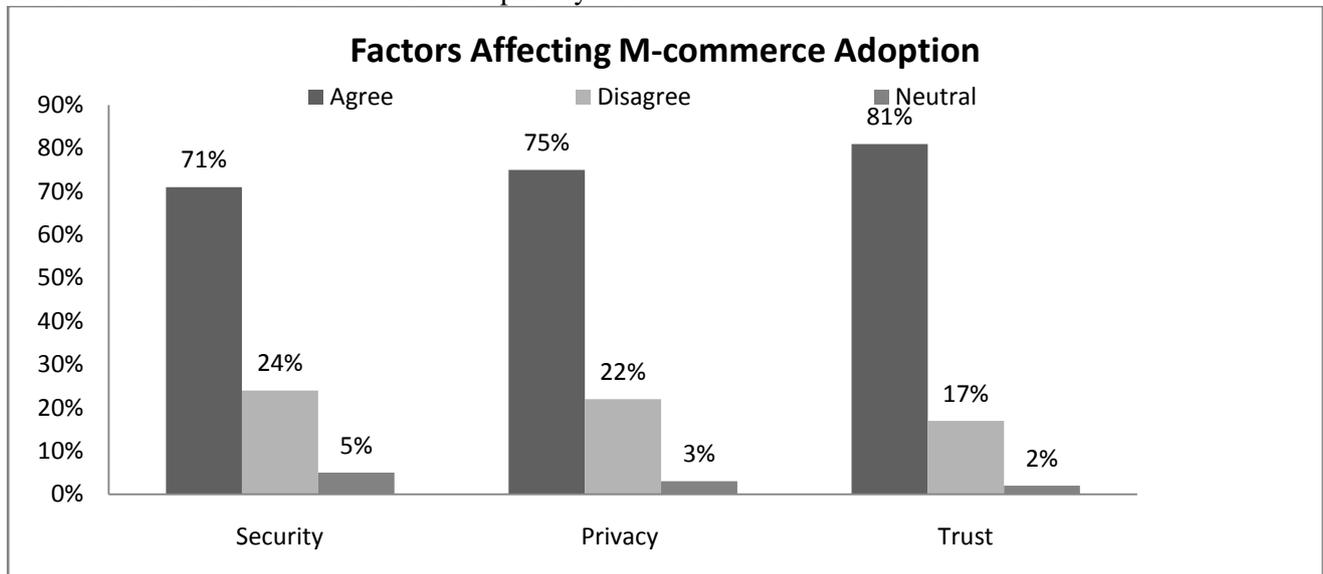


Figure 5. Factors Affecting M-commerce Adoption

These two issues security and privacy appear as a contributing factors to the trust as majority of the respondents 81% have indicated that they have no or lack of trust on the M-commerce services. The trust is considered as one of the most important factor in business transactions. The trust does not build instantly. It is built on completing a series of successful transactions in a real or virtual environment where buyers and sellers get the satisfaction over their business interactions.

The majority of the respondents indicated their concerns on security, privacy of transactions and importantly trust deficit. They are very much alarming on the adoption issues of M-commerce services.

This finding may lead to some other factors which may be contributing to swift M-commerce adoption in the country such as lack of clear regulatory framework, legislations, awareness, risks and uncertainties of other side of the business partners which are not been investigated in the study.

4. Findings and Discussions

In Oman the M-commerce services are easily accessible and the users have positive attitudes, but

still they do not prefer to adopt them. Figure 5 shows that only 26% of the users prefer while 70% do not ready to adopt in their businesses, which is quite a big number. The common concerns as suggested are the business transactions security, privacy, risks as the transactions occur in virtual setups where the buyers and sellers are anonymous.

These factors contribute in building users' trust. The trust appears as one of the major inhibiting factor for adopting M-commerce services. The people appear to have doubts over business transactions security and its confidentiality and the lack of firm legislations in the country.

Exploring more on these issues and to understand the possible reasons for a slow adoption of these services, informal interviews were conducted with the users and the following observations were made.

- Many mobile users were unaware of these M-commerce services initiatives as there were no or very little publicity and marketing campaigns to promote them.
- Many individuals were unaware of the benefits of using M-commerce service. Hence they were

reluctant to change from the traditional ways of doing business to the newly offered services.

- Many users were not fully comfortable in using their mobile devices and were not so keen to try the new services.
- Many users experienced sometimes slow responses from the mobile networks or its unavailability. Such incidents may contributed negatively towards users' attitudes, trust, satisfaction, and the services credibility
- Many users felt the costs of SMS and MMS were high which limit the adopters of these services.

5. Summary and Conclusion

The Sultanate of Oman is continuously taking many initiatives to promote Oman to e-Oman by adopting the country's digital strategy based on modern technology. This study is an attempt towards understanding and high lighting the issues related to the adoption of M-commerce services recently offered in Oman. The results of this study showed that majority of the mobile users have easy access to these services and had positive attitudes towards them. They felt that the services were useful, easy to use and friendly. The ATM transmutes that the user's attitudes determine the intention which lead the users to the actual usage of the system. The results indicated that besides users' positive attitudes not many users were willing to adopt the services offered. The users had shown their concerns on issues related to business transaction security, privacy and the most important is the trust between the users and services offered.

The finding suggests that all positive attitudinal attributes such as speed, user friendly, easy to use and usefulness lagged far behind and the factors like security, privacy and trust prevails affecting on the swift adoption of M-commerce services offered in Oman. There is a need to educate and create more awareness among the users on the services offered and address their concerns.

The implication of this study for the decision makers and technical experts is to enhance the security, confidentiality and privacy of business transactions over the wired or wireless media to give more trust to the users of the M-commerce services.

The main limitations of the study are the sample size and robust analytical model. There is a need for further exploration to see the impact of each individual M-commerce service offered to its users. The outcome of this research work may provide a background for further investigations and explore other factors as well on the M-commerce services offered in Oman or elsewhere.

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