FACTORS AFFECTING THE ATTITUDE TOWARD MOBILE COMMERCE USAGE AMONG LEBANESE CONSUMERS: A CONCEPTUAL FRAMEWORK

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ABSTRACT

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Mobile commerce is a worldwide innovation. However, in Lebanon, several factors are hindering its development. Therefore, our objective is to find the factors influencing the consumer's attitude toward the use of mobile commerce and to create a research model reflecting our findings. This research revises the basic theories of technology adoption and studies conducted in m-commerce, e-commerce, and related fields. An exploratory study of deep interviews with 14 consumers and experts was held, and a content analysis by themes was performed to show the consistent variables for our conceptual framework. New derived variables, the situational factor and digital culture tend to moderate the relations between independent and dependent variables. Service availability, self-efficacy and social-influence significantly influence the consumer's attitude toward the use of m-commerce, while cost is negatively affected. This study has both theoretical and managerial implications, it presents a new research model compared to prior studies in online service technologies, especially in mobile commerce. In addition, results provide online businesses with many trusted recommendations for their strategic plans based on analyzed and accurate data.

Keywords: Innovation, Mobile commerce, Consumer's attitude, Exploratory study, digital culture.

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INTRODUCTION

The rapid evolution of technology and telecommunication, especially the development of smartphones from being a way to communicate to be a way to search, to work, and to make commercial transactions, in addition to their unique characteristics defined by the location-based services, the internet services (4G and 5G), and the ubiquity, all these factors force the companies to enroll in the digital era and find new opportunities, to meet this transformation. Moreover, the number of global smartphone users has constantly been growing ever since the first smartphones hit the market, surpassing the three billion marks for the first time in 2019, and this growth trend is forecast to continue over the next few years (Statista, 2020). This increase will affect m-commerce growth since in 2021, 72.9 percent of all retail e-commerce is expected to be generated via m-commerce, up from 58.9 percent in 2017 according to Statista 2021.

However, although the number of mobile subscribers is increasing, and m-commerce is growing in developing countries, the usage of m-commerce compared with the developed ones is often lower and slower. Therefore, the aim of this study is explained in the following question: 'What are the factors that influence the Lebanese consumer's attitude of consumers toward the use of mobile commerce technology?

This research covers two aspects: a theoretical aspect that fills the existing research gap by providing a conceptual new research model, based on variables derived from the basic models of technology and services studies, especially in mobile commerce (Kalinic & Marinkovic, 2016; Yee & Chong, 2013; Khalifa *et al*., 2012; Wei *et al*., 2009; Kim *et al*., 2007; Hong et al., 2006; Wu & Wang, 2005), moreover, the model also presents the variables derived from an exploratory study that makes its point of differentiation.

A managerial aspect is also found to enable companies and managers evaluating mobile commerce as a potential channel, through which they can promote their products and services, and set the suitable online marketing strategies that lead to a higher m-commerce acceptance rates based on the influential factors found in our study.

This paper is outlined as follows. First, we provide a literature on the adoption of innovation and technology, a mobile commerce overview, its development and statistics worldwide, the second section briefly discuss the technology status of the context, followed by the general propositions derived from literature, next we discussed the methodology followed by the results of the exploratory study and the research design. A discussion

followed the research design. Finally, we present implications, limitations, and suggestions for future research, with a conclusion.

MATERIALS AND METHODS

1. Theoretical background

1.1 Adoption of innovation

The concept of adoption of innovation has been the subject of several studies for a very long time. The innovation was widely defined by different researchers and authors, but Rogers's theory was the commonly known in the diffusion of innovation and the adoption of technologies.

For Rogers (2003), the word 'technology' and "innovation" are used as synonyms, so he defined the innovation as being any object, idea, technology or practice that is new to a company, he also identified the principal concept of the theory by four factors, that impact the spread of a brand-new idea: the innovation, communication channels, time and social system, and classifies five categories of adopters on the basis of their innovativeness: innovators, early adopters, early majority, late majority and laggards, moreover he identifies the differences between these two groups "in terms of socioeconomic status, personality variables, and communication behaviors, which usually are positively related to innovativeness".

However, Roger's theory of diffusion faces many criticisms such as the Pro-innovation bias, the individual-blame bias, the recall problem in diffusion research, which may lead to inaccuracies when respondents are asked to remember the time at which they adopted a new idea, the one-way information flow and other evaluations…As discussed earlier**,** innovation is any new idea, product or service that became in use. Therefore, e-commerce and m-commerce are forms of innovation since they present new services and processes for businesses and individuals, especially for m-commerce users who are the central of focalization in our research, and a potential source for economic growth and for creating new jobs (Mokyr, 2002; Foxon *et al*., 2005).

1.2 History of mobile commerce

Mobile commerce is explained by Müller and Veerse (2000), as "*any transaction with a monetary value that is conducted via a mobile telecommunications network,"* and is

presented as a form of e-commerce conducted over mobile or wireless networks and is maybe very different from its traditional desktop computer–based precursor, in as much as m-commerce services are accessible *on the move* through devices (such as Smartphone and tablets) with fundamentally different presentation, processing, and interaction modalities compared to a desktop computer (Mylonopoulos *et al*., 2003; Ngai *et al*., 2007). Such services enable a whole new form of unique service capabilities, including location awareness, context sensing, and push delivery.

"*M-commerce refers to pairing of mobile devices with commercial transactions, giving customers services anywhere and anytime through a wireless, Internet-enabled device, and without the utilization of a computer*" (Clarke, 2001).

Further to the previous similar definitions, we will limit our definition of mobile commerce in our study to:" *any financial transaction of goods and services conducted via a Smartphone device*," not taking into consideration any other handheld device.

With all phenomena that have impacted the lives of humans in profound way, the mobile revolution has attracted the hobby of many heavyweight players that have rendered today's marketplace no longer just hypercompetitive, but literally the battleground for the records and communications era marketplace's giants. This battle is still ongoing and may be summarized in a three-technology trajectory (Eras) from closed ("walled garden") to open-ended solutions and returned (Panos *et al*., 2012).

With the integration of Apple (iPhone, iPad, iTunes), Google (Android), Microsoft (windows Smartphone) and other developed tool and platform improvements that managed to seize big audiences in various sorts of closed-ended, mobile applications (m-apps) are termed the 0.33 era of m-commerce (circa 2007 to this point). Such commercial enterprise models popularized the manufacturer-a third party utility distribution to allow users to find out, download, or purchase mobile applications, thereby growing a new m-commerce ecosystem. The big audience drawn to such m-apps has attracted more huge organizations of developers who compete to offer the best deal, thus creating a large pool of m-apps that attract additional clients.

1.3 Shifting from e-commerce to m-commerce

M-commerce is a form of e-commerce sharing the same features through mobile devices, so it is essential to explain the differences between these two terms. In 2010, Hoang in his thesis said that, electronic commerce signifies an anytime access to business processes managed by

computer-mediated networks, it's also independent of the geographic location, as mentioned by Hohenberg and Rufera (2004), therefore m-commerce is considered as an effective way of delivering e-commerce to consumers regardless the time and location. Several key drivers helped the development of mobile commerce, such as the mobile middleware and internet enabled services, the transition toward fifth-generation telecommunication technologies and higher data rates, the smartphone penetration where users are more likely to use portable devices anywhere everywhere. In addition to the fact that handheld devices are much easier to carry, they save time and effort instead of using a desktop, but according to eMarketer, 5.11bn of smartphone users in 2019 prefer the smartphone on other devices with an increase of 10.8 % from the previous year.Figure 1 shows the Smartphone user penetration as a percentage of total global population from 2016 to 2021.

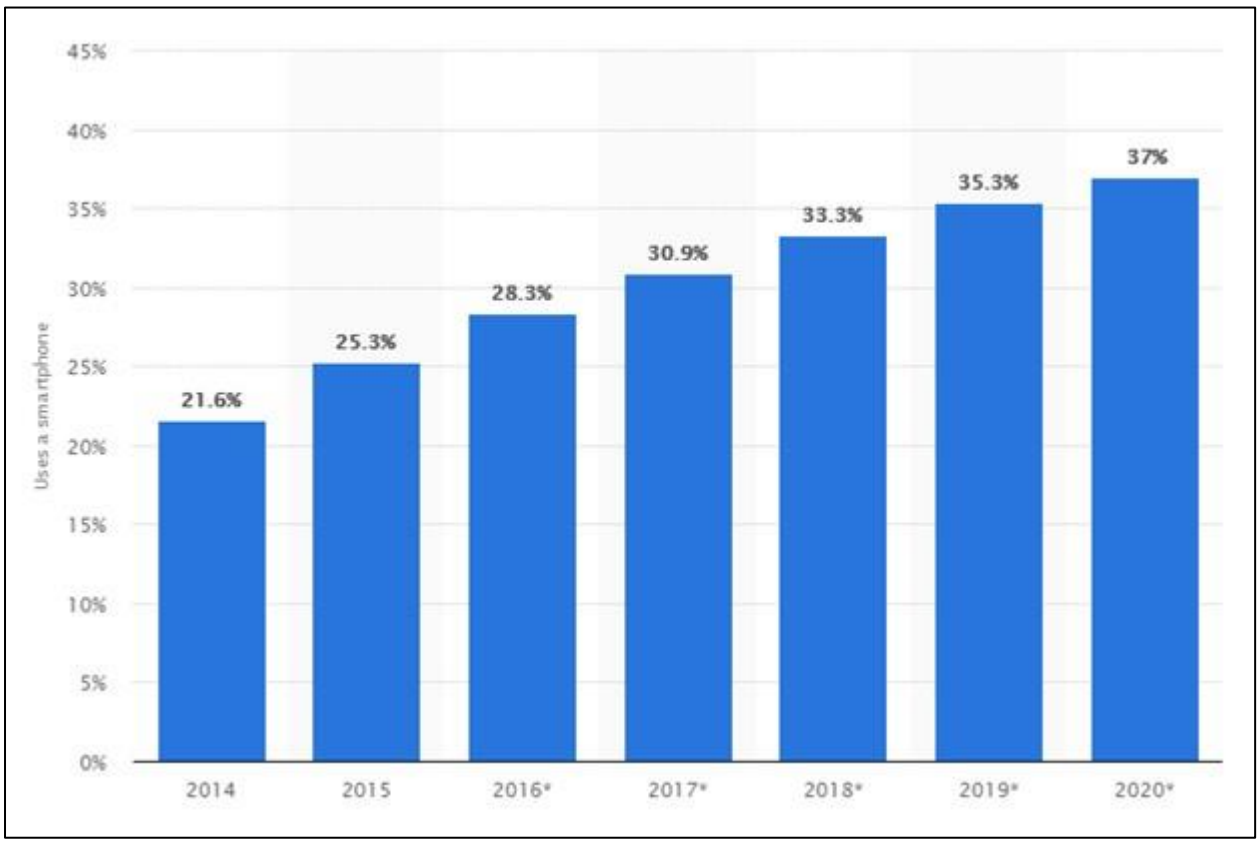

Figure 1. Smartphone user penetration as a percentage of total global population from 2016 to 2021 (Source: Statista, 2020)

The number of smartphone users worldwide has surpassed three billion, with several hundred million more expected in the coming years. This difference between m-commerce

and internet-based e-commerce can be generalized into two dimensions, namely *technology* and *value*.

Perceived difference in technology between m-commerce and e-commerce refers to perceived differences in end-user devices and communication networks. In case e-commerce, end-user devices are personal computers (PCS) with large screens, rich audio and video, standard keyboard and sufficient power supply and communication networks are broadband with high transmission speed.

However, in m-commerce, the user interfaces are small screen, incomplete text input keyboard and limited power supply. Still, communication strength through mobile devices is not strong enough, so consumers may encounter battery discharge because of the limits of battery while conducting mobile transactions.

Perceived difference in Value compared to traditional pattern of shopping, consumers can perceive several benefits of purchasing via internet or mobile internet, such as a greater variety of products, time savings, increased convenience, and improved efficiency (Lu and Su, 2009).

M-commerce has its own unique attributes such as ubiquity, mobility, personal identity, and localization, where personal identity stems from the relationship between the mobile device and the user, whereas localization refers to the ability to track the geographic position of the user. With the support of these two characteristics of m-commerce, service providers can improve consumers' personalization perceptions.

Another part of the perceived advantage discrepancy between m-commerce and e-commerce is perceived differences in personalization expectations. (Cao *et al*., 2015). Below is a table of the main studies made on the effects of difference between e-commerce and m-commerce:

Table 1. Studies on the differences between e-commerce and m-commerce (Source: Cao *et al.* 2015)

Studies	*Difference perspective*	*M-commerce*	*E-commerce*
Zhang and Yuan (2002)	Technology	Tiny screen, bandwidth limited by spectrum, can be geographically located	Large screen, substantial memory, unlimited bandwidth, cannot be geographically located
	Nature of service	Simple transactions, time-critical and emergency handling	Complete and sophisticated transactions, overcome time limitation and always available
	Business model	Location sensitive service based on subscription	Customer self-service, free or limited service charge
Min et al. (2008)	Communication network	Limited bandwidth, low transmission speed	Broadband, high transmission speed
	Task and application	Used in many environments	Mainly used indoor
	End user device	Small screen, limited power supply	Large screen, sufficient power supply
	Value proposition	Personalised applications and services, location based applications	High intelligence application
Ozok and Wei (2010)	Human-related	Shopping from every wish location and at any time	
	Interface	Shopping with a convenient screen, keyboard, cursor movement	
	Product-related	Shopping for customised products, a large variety of products	
	Service-related	Being able to shop for customised products, getting a large variety of services, shopping in a secure environment	
Ghinea and Angelides (2004), Lu and Su (2009) and Kim et al. (2009b)	User interface	Limited battery power, bandwidth, and connection stability	Convenient battery power, bandwidth, and connection stability
Liao et al. (2005), Park (2006) and Kim et al. (2007)	Unique features of m-commerce	Convenience, ubiquity, localisation	Nil

Touch commerce is the new name for m-commerce. It may have seemed like a dream a few years ago to be able to buy something you want with a single finger tap, but it is now a fact thanks to the combination of touch screen technology and one-click shopping, which allows consumers to purchase items directly from their phones.

2. M-commerce in number

As we discussed earlier, smartphones evolution is the key developer of m-commerce. Indeed**, s**tatistics show that Smartphone's user penetration is expected to increase from 21.6% in 2014 to 37% in 2020**.** This increase may affect the m-commerce growth, according to eMarketer indicators. In 2021, m-commerce could round up some $3.5 trillion and afterward make up right around 75% (72.9 percent) of e-commerce sales (Statista, 2018). Again, m-commerce's share of worldwide on-line retail forecasts to exceed five-hundredth by 2021 and

continues growing in specific Asian nations like China and India, and conjointly had the highest percentage of digital users who made purchases via apps.

Consumer surveys also reveal that clothes, electronics, books, and games were the most purchasing apps via mobile, the biggest growing categories are consumer electronics by 33% and Home with 25% year on year. This purchase motivation is due to the ubiquity that they can shop online from anywhere. Two out of every three mobile shoppers in Mexico chose mobile devices because shopping apps saved them time (Research and Markets 2017). The percentage in the Middle East and gulf was even bigger because of the massive increase in supply, such as the wave of Omni channel players going online such as Al Tayer's. Ounass and Landmark (year), the local players have also expanded in terms of geography and categories, such as Namshi, Souq and Wadi. Many of these retailers have an established presence online, simultaneously, also many international players have fully established here - Asos, Jollychic, SheIn, Net-A-Porter, and Amazon. Consumers would buy more because they have so many options (Google, 2017). This mobile growth accounted 49 percent of e-commerce, or $252 billion in sales, in 2020.

In MENA, conducting online research is an important part of the consumer journey. Furthermore, consumers prefer to use their smartphones for online research and shopping. In UAE and Saudi Arabia for example, the mobile share of shopping-related search queries has averaged 70%, 55% in the UAE, 51 % Saudi Arabia and 32% Egypt, prefer to use Smartphone for online shopping (Thinkwithgoogle, 2018; Statista, 2018), noticing that there are no showing results for Lebanon, and this may indicate that purchasing via mobile phones in Lebanon, still in its very early stages.

3. A brief explanation of technology status in Lebanon:

3.1 Information Technology sector in Lebanon

The Lebanese Information Technology (ICT) sector is a fast-growing sector, reaching USD 543.5 million in 2019. It contributes 3% of Lebanon's GDP and forecasted to be greater than USD 7 billion by 2025 as reported by the Investment Development Authority of Lebanon (IDAL) in 2018.

The overall IT sector includes more than 800 IT agencies, out of which 89 companies operating in the software product field, generating software development for vertical industries, mainly for the healthcare. On the one hand, education, and banking sectors account 52% of software development and service companies, whereas 61 companies are

mainly involved in web hosting, web design and development. Alternatively, e-services account 36% of total software development and services companies.

3.2 -Telecommunication Sector in Lebanon

Telecommunications, after the VAT, was Lebanon's second-largest source of revenue in 2011, with net revenues reaching USD 1.4 billion. Various policy measures and government decisions to develop the sector have fueled steady growth in recent years. The "Lebanon 2020 Digital Telecom Vision" initiative, which began on July 1, 2015, is a five-year plan to upgrade the country's telecommunications infrastructure. and to implement -fiber-optic connectivity as well as 5G connections throughout the country by 2020, as stated by the Internet World Stats (2019).

3.3 -Mobile Telephony

We will focus on mobile network and telephony since the aim of our study is "mobile commerce." Mobile networks in Lebanon are owned and regulated by the Ministry of Telecommunications and managed by two private operators Alfa and Touch.

The mobile accounts registered in Lebanon remain lower than the Arab countries average of 110%, and the developing world average of 93%. Mobile growth is forecasted to average just 1.45% over 2016-2020, with penetration remaining under 90% by the end of 2020.

With the introduction of 4G that expected to surpass 1.1mn by the end of 2021, the mobile broadband penetration rates are expected to be the highest area of expansion in the telecom market. Minister Harb, in his Agenda 2020 announced that an investment of 600 million dollars was put to improve the infrastructure, where **Alfa** signed a deal with **Ericsson** and **Nokia** in April 2016 to install 4.5G services in the country and to develop a 5G network in the future.

Unfortunately, the telecommunication sector faces many barriers through the political outlook, which does not support the creation of long-term goals to develop the telecom sector or support the development of genuine competition, added to it the fixed rates on mobile subscriptions imposed by the government, and the retention of direct ownership on telecom sector. All these issues will certainly negatively affect the mobile commerce in Lebanon.

In 2014, Lebanon ranks among the worst in the region in e-commerce penetration, only 9% of Internet users surveyed by ArabAd magazine are engaged in e-commerce, compared to other countries, however, a wide variety of e-commerce ventures are operational, despite the

continued lack of e-commerce law and regulatory framework for e-transactions, what thrust the banks to create new services to encourage the mobile commerce in Lebanon.

Bank Audi introduced a series of Tap2Pay for NFC Smartphone, also BLC bank introduced the revolutionary HEY! which allows instant peer-to-peer (P2P) transfers, Mr. Sehnaoui the chairperson of BLC said*:" we will be extending HEY! BLC to m-commerce users through integrating multiple solutions"* However, Uber and BLOM Bank together introduced the service UberBLOM, which is a Visa prepaid reloadable card, developed exclusively for Uber Riders. However, in 2019, digital Lebanon reports that only 0.7% of the population has a mobile money account, so we still can say that the mobile commerce in Lebanon is still in its infancy.

4. General propositions derived from literature

Going through the literature, especially with subjects related to m-commerce and online purchases, we identified various important factors explaining well this type of concept.

4.1 Perceived usefulness (PU)

PU has been widely discussed in studies related to technology, innovation, and adoption. It was first integrated in the theory of technology acceptance model TAM by (Davis, 1985), to be employed later under other names and definition.

For example, the motivation model explains the perceived usefulness as an "Extrinsic motivation."

PU was a significant factor affecting the intention of using information technology (Davis, 1989; Todd *et al*., 1992; Karahanna and Straub, 1999; Moore and Bembasat, 1991; Bhattachherjee and Premkumar, 2004) computers (Campeau and Higgins, 1991), mobile payment (Chen, 2006; Duane *et al*., 2014), m-commerce (Alkhunaizan and Steve Love, 2012; Zhou, 2011; Malik *et al*., 2013; Parker and Wang, 2016), mobile banking (Koksal, 2016; Tarhini *et al*., 2016) and mobile shopping (Shang and Wu, 2017).

Therefore, we propose that

- Perceived usefulness positively influences the attitude toward using mobile commerce

4.2 Perceived ease of use (PEOU)

PEOU as defined by (Davis, 1989) is "*the degree to which a person believes that using a particular system will be free of effort*". This variable was widely discussed by other theories like "complexity" in the theory of PC use (Thomson *et al*., 1991), and in the theory of innovation diffusion (Roger, 2003).This construct was usually studied with perceived usefulness in studies of technology acceptance and innovations and was a significant factor influencing the intention to use of Games based (Venkatesh and Smith, 1999), online shopping (Perea *et al*., 2004), information system (Davis and Venkatesh, 2004), and m-commerce (Maity, 2010).

Therefore, we propose that

- Perceived ease of use positively influences the attitude toward using mobile commerce

4.3 Social Influence (SI)

Social influence was first known in the theory of reasoned action (TRA), as 'subjective norms', then integrated by (Venkatesh, Morris and Davis, 2003) in the theory of planned behavior as: "*the extent to which an individual perceives important other believe that he or she should use the new system* ". It was also explained as external influence, including the mass media reports, expert opinions, and other nonpersonal influences (Bhattacherjee, 2000), similar to other research that refer the interpersonal influence to the word of mouth (WOM) by referent groups like peers, friends, superiors, computer and technology experts (Elliot and Philips, 2004).

Many researchers have discussed the "word of mouth" in e-commerce (Papadopoul and Pelet, 2013), m-commerce (Parker and Wang, 2016), mobile shopping (Shang and Wu, 2017), and is considered an important mechanism on internet. Nevertheless (Lewis *et al*., 2015) supposed that social influence may positively affect the behavior intention and reduce the perceived risks

Therefore, we propose that

- Social influence positively influences the attitude toward using mobile commerce

4.4 Self-efficacy (SE)

Self-efficacy is defined by (Bandura, 1977) as "*people's beliefs in their capabilities to mobilize motivation, cognitive resources, and courses of action needed to exercise control over events in their lives*".

Many researchers have extended the self-efficacy construct to cope it more with their field of study such as (Hsu and Chiu, 2004) who discusses the "internet self-efficacy" to explain the consumers' decisions in e-commerce use, and (Audi *et al*., 2016), who created the MCSE (mobile computing self-efficacy), to demonstrate the strong direct effect of mobile computing self-efficacy on users initial trust in location-based app vendors, as well as their perceived risk of disclosing information.

Moreover, (Saleh, 2008) studied the computer self-efficacy levels among the faculty of the college of education at the Lebanese University (LU) and found that only 14 (11%) had low computer self-efficacy scores, so Saleh synthesized that instructional designers at LU should consider special efforts and training structured to help increase low computer self-efficacy to at least a moderate level.

Therefore, we propose that

- Self-efficacy positively influences the attitude toward using mobile commerce.

4.5 Trust

(Monsué *et al*., 2004) declared that Trust was commonly widely discussed by several researchers online shopping. For example, in Lebanon, (Koksal, 2016) studied the Lebanese consumers' intentions to adopt mobile banking and found that perceived credibility with their two dimensions privacy and security and perceived trust, positively and significantly discriminate high mobile banking adopters from low adopters. In the same context, (Audi *et al*., 2016), shows that trust positively affected consumer's attitude toward the banking services, (Shalhoub, 2006) also discussed the trust, privacy, and security in e-businesses in GCC countries and claimed that the lack of trust in online transactions is one of the main reasons for the relatively low electronic commerce adoption. Many studies have determined that trust has a positive significant impact on e-commerce (McKnight *et al*., 2002; Bhattacherjee, 2001; Gefen *et al*., 2003).

Therefore, we propose that

- Trust positively influences the attitude toward using mobile commerce.

4.6 Cost

Shifting from wired e-commerce (EC) to m-commerce (MC) incurs additional costs, including access equipment and transaction-related costs (Constantinides, 2002). Perceived financial cost has also had a significant negative influence on behavioral intention to use m-banking (Luarn and Lin, 2005).

As for the cost, it is considered a fundamental aspect for consumers when deciding whether or not to use m-commerce as mentioned (Hong *et al*. 2008), and it was one of the causes that may reduce the expansion of using m-commerce as described by (Wei *et al*. 2009), but the key point is in the creation and delivery of m-commerce as noted by (Sadi and Noorden, 2011).

However, (Alkhunaizan and Love, 2012), in KSA extended UTAUT to integrate two constructs "trust" and "cost" and fount that costs ($\beta = .185$, $t = 5.180$, $p < 0.001$), was the second largest predictor of usage intention toward m-commerce in Saudi Arabia.

This study suggests that cost, including cost of handset, subscription, service, and communication fees, may influence the consumer's attitude toward mobile commerce.

Therefore, we propose that ;

- Cost negatively influences the attitude toward using mobile commerce.

4.7 Service availability and Internet connection (PSA)

Many prior studies discussed the bandwidth and service availability and their influence on the user's intention to use or adopt a specific technology, where the major research issues are bandwidth and coverage as mentioned by (Varshnet *et al*., 2000). Other reviews, such as (Siau and lim, 2001) discussed the benefit role of high-speed connection on mobile application use in their research agenda.

Furthermore, (Hong et al., 2006), talked about the perception of service availability, which was concerned as a facilitating condition.

As discussed earlier, only 10% of Internet users in Lebanon shopped online as opposed to 40% globally. In 2019, this percentage increased to 16% with 0.7% having a mobile money account, blaming high internet costs and slow internet speeds for the relatively limited activity, in addition the "Lebanon 2020 Digital Telecom Vision" project is still in process, so we suppose that the internet connection and infrastructure are still considered as problems

that hinder the evolution of m-commerce in Lebanon and must be taken as an essential variable in our study.

Therefore, we can propose that an internet connection is an environmental condition that directly influence the attitude toward m-commerce.

- Connection speed positively influences the attitude toward using mobile commerce.

As a result, we considered seven independent variables: "*Perceived usefulness, Perceived ease of use, Social Influence, Trust, Self-efficacy, Cost, internet connection,"* and one dependent variable: "*Attitude*", we chose attitude, because intention, needs a longitudinal study and time to be measured, while the mobile-commerce applications have many prototypes available in the Lebanese market and ready to test and use, so the users don't need to build an intention toward the use, because their attitudes and beliefs are already created. Moreover, mobile commerce in Lebanon is still in its early stages, so we decide to depend on attitude as a predictor of mobile commerce use.

5. Methodology

Lebanon, unlike the developed countries is facing many barriers hindering the development of mobile technologies, furthermore, mobile commerce in Lebanon is still in its early stage, and this is well shown by the 16% of population who makes online purchases and 0.7% who have a mobile money account, according to the digital report 2020.

However, Lebanese consumers, particularly young and adults are interested in mobile commerce, but several issues impede its usage, therefore a qualitative exploratory study is conducted. We made an interview guide with general questions related to the factors of this technology adoption. The questions were semi-direct and the interviews were made face to face with nine consumers who experienced mobile commerce and five experts in e-commerce and digital marketing field, we intended to have two populations so consumers can describe their attitude, toward mobile commerce in their daily life on one hand, and experts can give us a valuable evaluation of the market and consumer needs, based on their vision and studies. The interviewees' profiles are detailed in table 2 and table 3:

Table 2. Profile of consumers' interviewees

Interviewee	Age	Gender	Education	Marital Status	Career industry/position	Region
I1	23	Female	Bachelor in Advertising	Single	student	Beirut suburb
I2	20	Male	Telecommunication engineering	Single	student	Village
I3	22	Male	finished high school	Single	None	Village
I4	22	Female	Master in International business management	Single	None	Village
I5	36	Female	Master Telecommunication engineering	Married with four kids	In E-learning firm	Saida
I6	30	Male	master's degree in information communication	Single	Quality assurance	Beirut
I7	27	Male	master student in migration studies	Single	documentation	Beirut
I8	38	Female	Bachelor degree in Law	Married with one girl	distributor coordinator in a research center	Village
I9	27	Male	Master advertising	Single	In a Digital media agency	Beirut

Table 3. Profiles of experts' interviewees

Experts	Age	Profession \ Field expertise
E1	40-45	
E2	45-50	Consultant in e-marketing and e-commerce
E3	40-45	CEO and co-founder of Hicart.com
E4	35-40	Business owner for exclusive management company
E5	35-40	E-commerce consultant

The number of interviews was enough for our exploratory study since we reached the saturation of the answers. The sample was limited to young-adult Lebanese users living in Lebanon with different sociodemographic profiles, and the duration of each interview took from thirty to forty minutes for consumers and forty to sixty minutes for experts, it means about forty-five minutes as average. We chose the "themes" as a unit measure of the content analysis, where each theme is also developed into sub-themes. Two analyses, the vertical and horizontal are considered:

-The vertical analysis shows the interviewee's approach through the categories in the grid

-The horizontal analysis is a transversal operation that shows how each element in the grid mainly the themes are elaborated by all the interviewees

6. Results presentation from qualitative study

According to *consumer's viewpoint*, social media are the most used applications on smartphones, whereas Ease of use is an important factor to install these apps, I7: *"It really does help your day to day life making it easier a lot so I think that's the main reason and all motivation for my use and why I'm convinced.,"* while the barriers from installing apps and services are the lack of need, I5: *"It takes too much place on the phone. Some applications are unworthy to download".*

We grouped the two factors: knowledge and experience, under one theme named "self-efficacy," so 70% of the interviewees rely on searching, tutorials, and YouTube, in addition 83% of interviewees tend to buy more goods than services.

The cost of fees and services, infrastructure mainly the internet connection and delivery address, are the most barriers that hinder Lebanese consumers of using mobile commerce.

I9:"In Lebanon using an application to buy things online is really high".

I2 :"*GPS problem, so If you want to send something specifically to your house, it must be next to a known place or you have to send it to somewhere else than go and get it by you own".*

Credibility and Trust are positive influencers on consumers to use mobile commerce in Lebanon by 43% when using technology, especially with smartphone's application, whereas ease of use and usefulness is less important regarding consumers' opinion, with 21% and 11% respectively.

Only one of the interviewees shows a negative attitude toward mobile commerce, in fact, 70% like the concept. Nevertheless, the interviewees think that mobile commerce in Lebanon needs an evolution and improvement to encourage the use of mobile commerce.

Situational factors, tend to fluctuate the influence on attitude toward mobile commerce, interviews talked about the geographical location, product details, the accessibility via smartphone and the market limitation in Lebanon, I6:" *Some shops that doesn't exist in Lebanon like Abercrombie or Levis"*. Therefore, we set this factor as a moderator factor in our research model.

According to *experts' perspective:* they mostly focus on targeting the market and assuring costumer services because Lebanese consumers are looking to receive their products as soon as possible with a lowest price, but the failure was when Lebanese market wasn't ready to pay online and use any credit card.

The economy status of Lebanon in addition to its instability, were and continue to be, the main barriers which face e-businesses from launching any service, so building trust with consumers and convince them to buy online is difficult.

They assume that, to develop mobile commerce, the objective is how to market this application. On the other hand, experts think that mobile conversion is better than a mobile application in mobile commerce, because for an application to be successful, it should have a lot of followers and based on a reputable brand. However, experts talked about the need to ensure trust and safety to consumers when buying online, in addition to ensure an ecosystem in Lebanon. Lebanese government should move to "e-government" because once users use to pay online for their bills, they will be able to purchase all their needs online, but the major barrier according to experts is the cultural environment with 39%. Experts think that cultural behavior, mentality, digital education and habit, will affect the use of mobile commerce because it may influence the usefulness of this concept, so people are not aware about its

added value, the ease of use, and the self-efficacy toward the knowhow using of m-commerce.

E2:" *they should teach them what credit cards are what digital transactions and payment online is…….most people in Lebanon don't know what PayPal is or bitcoins*"

E5:"*they don't research well before buying"*

Therefore, we will assume the digital culture as a moderator variable for our research, also integrating the age as a moderator variable will add value to our research, especially in giving accurate results concerning the relations between independent and dependent variables.

7. Research Model

The research model is defined by comparing the main results of the literature review with those of the content analysis of the semi-direct interviews, either by adding or eliminating certain variables, therefore this model includes the following variable: perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), self-efficacy (SE), Trust, availability of service internet connection (PSA) and cost.

Whereas the variables that emerged from the qualitative study are the situational factors and Digital culture. These variables will be considered as moderator variables due to the importance they show from interviewees responses, to moderate the relations between independents and dependent variables.

We add "Age" as a moderator factor because of the information accuracy it gives, when comparing old to new generations regarding the use of technologies and mobile services. While Trust factor cover not only the privacy and security concerns toward online transactions, but also the trust in vendor while doing mobile- commerce. Therefore, we tend to divide the Trust variable into two sub-variables (Trust in Channel and Trust in e-vendor\ App-vendor), so the research model with the propositions is schematized by Figure 2:

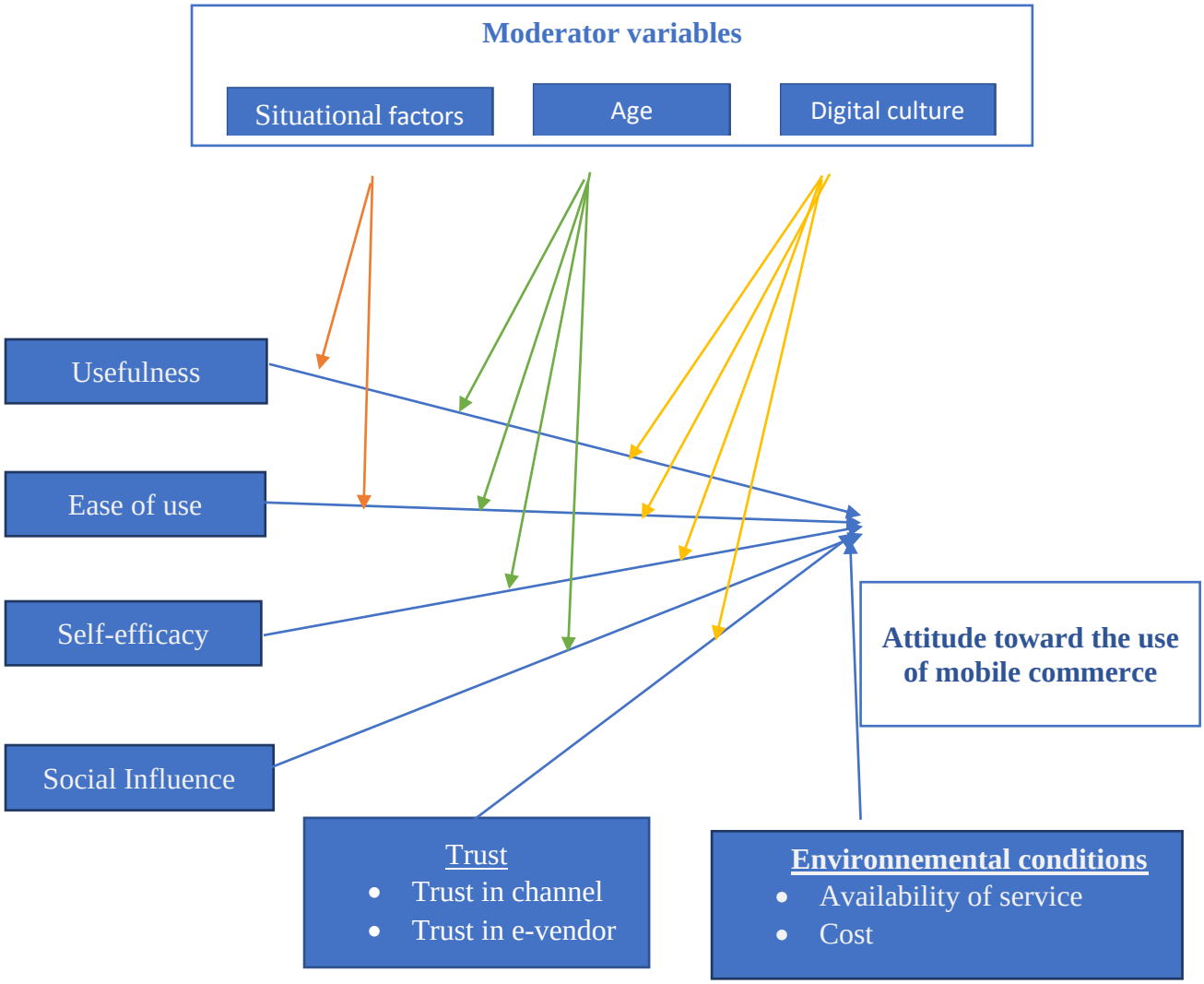

Figure 2. Research Model

RESULTS AND DISCUSSION

Our final propositions derived from the literature and qualitative study, resulting the following outcomes:

Self-efficacy and social influence are the highest influencers on consumer's attitude toward mobile commerce, with 69% and 59%, respectively, whereas usefulness and ease of use are the least significant, on the other hand, cost and internet connection are the highest barriers denying the consumer from doing m-commerce, where consumers assume that the cost of services and fees is expensive in Lebanon, moreover the internet connection needs an improvement to make mobile commerce feasible.

New variables (situational factor and digital culture) emerged from the qualitative study which can moderate the relations between independent and dependent variables.

Situational factors strongly moderate the relationship between usefulness and attitude, similarly to the relation between ease of use and attitude.

Whenever digital culture significantly moderates the relations of usefulness and attitude, ease of use and attitude, self-efficacy and attitude, social-influence, and attitude.

Not to eliminate the role of Age as a moderator variable, where usefulness, ease of use and self- efficacy is most moderated by users with age range 26-45, whereas social media is most moderated by age range 18-25.

8. Theoretical and managerial Contributions

This study presents a new research model compared to anterior studies in innovation, technology adoption, and especially mobile commerce, our results were not consistent with all the prior research, and this means that the context of the country studied present an originality that differs the results from others in the same field.

Moreover, the new variables derived from the exploratory study (situational factor and digital culture) add value to our model and give it this new form of distinctiveness.

These results are used to provide the companies, especially e-businesses, trusted recommendations based on analyzed interviews to evaluate the factors that may influence the consumer to use mobile commerce especially the young-adult consumers in Lebanon.

Therefore, companies should first find new applications, services and solutions that serve the consumer and assure his needs. In addition, the internet connection and the availability of the service is also highly considered from the consumer perspective, so here comes the role of the telecom sector to keep in developing the bandwidth and coverage of the internet and infrastructure. Moreover, consumers were sensitive to cost, so companies should provide discounted prices, coupons and offers on smartphone' apps and mobile websites to encourage the consumers to shop via smartphone. We also noticed that digital education and habit moderate the factors influencing the attitude toward mobile commerce, so schools should integrate the education in technology starting from primary schools, nevertheless the important role of government that should redesign its regime and converted it to a powerful e-government in order to voluntary enroll the Lebanese citizen in the electronic systems.

9. Research limitations and future perspective

Our study-concerned Lebanon and thus, results cannot be generalized, also, the geographic location of respondents was in Beirut and Mount Lebanon, which are the biggest provinces, due to the reach flexibility of the customer potential experience toward online transactions.

Hedonic factors were not considered since we limited our study on the utilitarian ones. It would be interesting for other studies to do a quantitative survey for testing the conceptual model and propose it in a different context, moreover, the future research can study different range of age, like elder or teenager to discover new factors, also they can scope the study on different regions outside Beirut and Mount Lebanon.

CONCLUSION

Lebanese consumers, unlike developed countries are still unaware of mobile commerce concept, and several factors are hindering its utilization, thus mobile commerce in Lebanon is still in its early stage.

Therefore, this research aims to find the factors that may influence the Lebanese' consumer to use mobile commerce. We performed a qualitative study, the analysis was done using the theme analysis technique, and it was calculated vertically and horizontally. Propositions show that internet connection, social influence and self-efficacy were the most significant factors influencing consumers to use mobile commerce, whereas usefulness and ease of use are the weakest. Situational factors and digital culture are two variables derived from the exploratory study and moderate the relations between independent and dependent variables. This research model is an original finding to the theories of technologies and provides companies in online commerce trusted information and recommendations. This stream of research will be fruitful for future interdisciplinary research in e-commerce, technology adoption, and mobile services, also for countries with similar context.

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APPENDIX

Table 4. Themes derived from experts' interviews

Themes	**Sub-Themes**	
Apps/Services launched	Applications	
	Services	
Online Commerce type	Products	
	Services	
Reasons of Successful \ Failures	Reasons of Successful	Customer service
		Mobile conversion
		Social media
		Shipping mode
		Target Market
	Reasons of failures	
Barriers when launching app\ service	Trust	
	Status of country	
Motivations toward mobile commerce	Technical facilities	Application
		Apps vs mobile version
	Ease of use	
	Social media	
	Credibility	Security
		Privacy
	Trust	
	Ecosystem	Government role
		Agencies
		Regulation restriction
		Payment gateways
		Technology
	Country's stability	Economic stability
		Politics stability
Barriers toward mobile commerce	Internet connection	
	Payment method	
	Shipment mode	

	Price	Price of goods
		Cost of financial resources
		Cost of internet fees and services
		Cost to download an app
	Self-efficacy	Personal Traits
		Resistance of change
Digital culture (moderator variable)	Cultural behaviour	
	Mentality	
	Language	
	Digital education	
Demographic factors (moderator variable)	Age	
Attitude	Positive	
	Negative	

Table 5. Consumer interviews analysis- Motivation toward mobile commerce utilization

Themes and sub-themes:		**Interviewees**												
Motivation toward mobile commerce utilization		**I 1**	**I 2**	**I 3**	***I 4***	**I 5**	**I 6**	**I 7**	**I 8**	**I 9**	**Total**	**Frequency**		
Credibility (Security and privacy)	Financial transaction	1		2	2			1		2	8	24	0.33	0.43
	Personal information	3	2	5	2	2		1		1	16		0.67	
Trust		3	2	3	3	2	1				14			0.25
Usefulness			2	1		1		1		1	6			0.11
Ease of use		2	1		4		1	2		2	12			0.21
Total											56			1.00

Table 6. Consumer interviews analysis- Barriers toward mobile commerce utilization

Themes and sub-themes:		**Interviewees**											
Environmental conditions		**I1**	**I 2**	**I 3**	***I 4***	**I 5**	**I 6**	**I 7**	**I 8**	**I 9**	**To tal**	**Freq uenc y**	
Cost	Cost Fees of service or application	2	2		2	2	3	1	3	1	16	0.94	
	Cost of goods								1		1	0.06	
	Total										17	0.30	
Comparison to other countries	Internet connection		2	1		1		1			5	0.45	
	Cost of services	1					1	3	1		6	0.55	
	Total										11	1	
			I 1	**I 2**	**I 3**	***I 4***	**I 5**	**I 6**	**I 7**	**I 8**	**I9**	**Total**	**Frequency**
Infrastructure	Internet connection	Speed	1	1	5	2	2		4	1	2	18	21 0.62 0.72
		Internet coverage	2							1		3	0.10
		Wi-Fi VS 3G/4G	1		3	2			1			7	0.24
	Electricity							1				1	0.03
	Total											29	0.51
		I1	**I 2**	**I 3**	***I 4***	**I 5**	**I 6**	**I 7**	**I 8**	**I 9**	**To tal**	**Freq uenc y**	
Shipment mode	Delivery time								1		1	0.1	
	Delivery address		2	2	1				2		7	0.7	
	Delivery cost		1						1		2	0.2	
	Total										10	0.17	
Payment Methods	Credit card	1		1		1	1	1			5	0.36	
	Cash on delivery	1							1		2	0.14	
	Internet card		1		1	1			1		4	0.29	
	PayPal					1	1		1		3	0.21	
	Total										14	1	

Table 7. Experts interviews analysis- Motivations toward mobile commerce

Themes and sub-themes:		**Experts**								
Motivations toward mobile commerce		**E1**	**E2**	**E3**	**E4**	**E5**	**Total**		**Frequency**	
Technical facilities	Application	1	3	5			9		0.75	
	Apps vs mobile version	1				2	3	12	0.25	0.21
Ease of use		1	2	1		2	6			0.10
Social media						1	1			0.02
Credibility	Security	3	1		1		5		0.26	
	Privacy	3	2	2			7	19	0.37	0.33
Trust		1	4	2	2	2	11			0.19
Ecosystem	Government role	1			1		2		0.22	
	Agencies				1		1		0.11	
	Regulation restriction	2					2		0.22	
	Payment gateways	1				2	3		0.33	
	Technology			1			1	9	0.11	0.16
Total							58		1.00	

Table 8. Experts interviews analysis- Barriers toward mobile commerce

Themes and sub-themes:		**Experts**								
Barriers toward mobile commerce		**E1**	**E2**	**E3**	**E4**	**E5**	**Total**		**Frequency**	
Cultural Environment	Cultural behaviour	2	4		2	2	10		0.34	
	Mentality			1	4	1	6		0.21	
	Language		1				1		0.03	
	Digital education	2	4	2		4	12	29	0.41	0.39
Country's stability	Economic stability	2			1		3		0.60	
	Politics stability	2					2	5	0.40	0.07
Internet connection		1	3	2			6			0.08
Payment method		2	3	1		2	8			0.11
Shipment mode				4		2	6			0.08
Price	Price of goods	2			2		4		0.40	
	Cost of financial resources	1					1		0.10	
	Cost of internet fees and services		2				2		0.20	
	Cost to download an app					3	3	10	0.30	0.14
Self-efficacy	Personal Traits	2		2			4		0.40	
	Resistance of change					2	2		0.20	
	Habit	2		2			4		0.40	0.14
Total							74		1.00	