MIRIYEVA NARMIN[*]

The mobile commerce as the next generation of e-commerce

Abstract

In just several years, commercial transactions through the Internet and other online platforms have expanded in a great amount. Furthermore, the majority of these transactions are made either through e-commerce applications or by other innovative online platforms.

One of these updated and technology-facilitated communication ways are transactions via mobile and portable devices. Mobile services have displayed an incredible increase in preceding years and the situation is changing rapidly due to the widespread use of smartphones and tablet computers.

Mobile commerce is the latest new technology in the e-commerce market. The need for mobile commerce for a businessman is very relevant. The tendency of new technologies has become a changing point in the market.

Mobile commerce is leveraging the potential of wireless technology to expand the reach of e-commerce applications anytime and anywhere. Mobile applications can be used to support transactions with customers and suppliers, as well as to conduct e-business inside and outside organizational boundaries and become an integral part of an organization's strategy.

This paper provides a broad overview of what mobile commerce is, its evolution, unique features and as well as applications of mobile commerce for business sphere and social life.

Mobile commerce has great power not only for consumers but also for business entrepreneurs. As long as you have a mobile device, you can easily reach the Internet and use the services of mobile commerce anywhere and anytime without any constraints.

Keywords: mobile devices, literature review, e-commerce, m-commerce, wireless technology, unique features of mobile commerce, mobile commerce application.,

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[*] PhD Student, The University of Szeged, Faculty of Law and Political Sciences

Introduction

The advent of wireless technology has also brought wireless data services to mobile commerce in many developing countries. As the convergence of mobile and fixed Internet, and information communication technologies continues, access to the internet for a large part of the world is reached with mobile phones and networks. Shortly before Internet-facilitated e-commerce has begun to spread, a new wave of technology-based commerce - mobile commerce or m-commerce has started.[1]Wireless technologies have prevailed even in relatively low-income areas.[2]

Since e-commerce appeared in the business market there was also a great interest in the business conducted with wireless and portable devices. A new wave of technology-driven commerce has started: - mobile commerce. Mobile commerce is important because this technological revolution directly or indirectly affects every person not only individually but also commercially in the paced world of technology. First and foremost, mobile and portable devices became widespread and effective as the means of commercial transactions and business practices. Secondly, the world is turning into a global mobile era. According to one widely quoted statistic, people own more cell phones today than toothbrushes![3] And as the result of mobility "the world is in your pocket", this means that all that you search related from technology to FAQs you can find in your handheld easily.

Mobile commerce, is a subset of electronic commerce. While traditional e-commerce refers to transactions conducted via fixed or wired Internet terminals, mobile commerce refers to e-commerce transactions via mobile or wireless terminals. [4]

The impact of mobile e-commerce and its innovations on development and application in the areas of society, the economy, culture, organizations, government, industry and everyday human life are crucial.[5] It is obvious that day by day the mobile opportunities and applications are increasing. The business industry can't imagine their trading life without wireless and mobile technology interactions anymore. Today, mobile commerce covers almost all areas of life. Mobile services are in the areas of entertainment, travel, banking and marketing

All above followings show that mobile commerce technologies have a profound impact on the way people search out and conduct transactions, interact and communicate, plan and carry out activities, and entertain themselves and play.

When mobile commerce vendors, IT/IS developers, and users will understand the implications and outlooks of mobile commerce, then they can continue to proceed with these wireless transactions without any obstacles.

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[1] G.S. OREKU: *Mobile technology interaction to e-commerce in promising of u-commerce.* African Journal of Business Management, vol.7(2), 2013. p. 85.

[2] United Nations Conference on Trade and Development, E-commerce and Development Report, New York, United Nations, 2002. p. xxiii.

[3] E. TURBAN, L. VOLONINO and G.R. WOOD: *Information Technology for Management: Advancing sustainable, profitable business growth.* New York, John Wiley & Sons, Inc., 2013, p. 199.

[4] T. JELASSI and A. ENDERS: *Strategies for E-Business: Creating value through electronic and mobile commerce.* Harlow, Pearson Education, 2004. p. 5.

[5] J. WEI (Ed): *Mobile electronic commerce: foundations, development, and applications.* Boca Raton, CRC Press, 2015. p. xi.

What makes mobile commerce so unique and powerful is that due to unleashed limitation mobile commerce has no locational and physical barriers. Generally speaking, mobile commerce has such potential and opportunity that you can get access to it anytime, anywhere and practically for anything.[6]

Mobile commerce is any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device.[7]

Mobile technologies are facing the urgent problem of managing access, demand and information exchange issues.[8]

Some authors define mobile commerce as any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device.[9]

Mobile commerce, or m-commerce, is the buying or selling of goods and services using a wireless, handheld device such as a cell phone or tablet (slate) computer.[10]

Mobile commerce is often defined as the buying and selling of goods and services using wireless handheld devices such as mobile telephones or personal data assistants (PDAs).[11]

Wireless Internet, its commercial use, mobile commerce, present entrepreneurs with opportunities and challenges.[12]

It is obvious that day by day the mobile opportunities and applications are increasing thus, the business industry can't imagine their trading life without wireless and mobile technology interactions. Consumers' pockets won't be the only place for a purse, but also there will be a place for wireless technology and commercial services united in one mobile device.

Frequently mobile commerce is represented as a subset of e-commerce. There are similarities between e-commerce and m-commerce from being able to purchase a product or service in a virtual environment. In this paper, mobile commerce is recognized as a unique business opportunity with its own unique characteristics and functions, not just an extension of Internet-based e-commerce.[13]

This article is structured as follows. In Part 1 we will highlight the historical background and Part 2 will be dedicated to the definition and the literature review of mobile commerce. Part 3 consists of the unique features of mobile commerce and Part 4 is devoted to mobile commerce applications. Finally, we make some conclusions and propose possible paths for the future mobile industry.

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[6] B.E. MENNECKE and T.J. STRADER: *Mobile Commerce Technology, theory and Applications.* Idea Group Publishing, Hershey, 2002. p. 11.

[7] R. TIWARI, S. BUSE and C. HERSTATT: *From Electronic to Mobile commerce: Technology convergence enables innovative business services.* Hamburg University of Technology, 2006. p. 6.

[8] OREKU 2013, p. 86.

[9] S. A. R. GOLDEN and S. B. REGI: *Mobile commerce in modern Business Era, International Journal of current Research and Academic Review*, volume 1, number 4. 2013. pp. 96–97.

[10] TURBAN: *Volonino and Wood.* 2013. p. 199.

[11] *United Nations Conference on Trade and Development,* 2002. p. xxiii.

[12] P. TARASEWICH, R. C. NICKERSON and M. WARKENTIN: *Wireless/Mobile E-commerce: Technologies, applications and issues.* Seventh Americas Conference on Information Systems, 2001. p. 437.

[13] D. XIAOJUN, I. JUNICHI and H. SHO: *Unique features of Mobile Commerce.* Journal of Electronic Science and Technology of China, Vol.2 No.3, 2004. p. 1.

1. History of mobile commerce

The history of mobile commerce practice to date can be studied through the aspects of the competitive dynamics of the mobile marketplace. As in the case of any phenomenon that has so strongly influenced the lives of many people, the mobile revolution has attracted the attention of many heavyweights who have made today's market not just hypercompetitive, but literally a battleground for information and communication technologies (ICT) market. This fight is still ongoing and can be reduced to a three-step trajectory.

Elliott and Phillips suggested that mobile wireless communications have evolved along a logical path from the relatively simple first generation (1G) analogue technologies to the current third generation (3G) digital.

The first generation of wireless communications devices was not progressed so fast and became only in the 1980s as the common use for the business world. Up to that time, wireless communication was practised only in a narrow sphere such as government and military purposes. However, it was not until the late 1970s and early 1980s that several improvements in microprocessor technology and reformations in cellular network infrastructures led to the birth of the 1G, wireless telecommunications systems. Moreover, all these communications were based on voice rather than data, transmission. The 1980s also witnessed the start of wireless mobile phone and telecommunications companies were amongst the most influential in the mobile commerce world, such as Nokia in Finland, Ericsson in Sweden and Motorola in the USA.[14]

The popularity of the second generation (2G) wireless telecommunications increased in the early 1990s which were based on digital (rather than analogue) technology. The main development of 2G occurred with the introduction of a higher capacity telecommunications network (and more globally compatible) known as the Global System for Mobile Communications (GSM).[15] 2G gave speed around 64 Kbps. Quality of sound was increased and also noise was reduced. First time SMS (short message service) and email were established. 2G was based on digital signals and these digital signals were so weak that the signals occasionally did not reach up to tower.[16] Despite the GSM network was primarily a Europe-oriented development, it has an effective commercial opportunity. Essentially it was less expensive for the international roaming calls and as a result, its standards were spread widely to other parts of the world. However, one significant disadvantage of 2G GSM networks was the fact that they were mainly voiced telecommunication networks with limited data transmission characteristics.[17]

3G technology was aimed at providing a wide variety of services and capabilities in addition to voice communication, such as multimedia data transfer, video streaming, video telephony, and full, unabridged Internet access. 3G mobile phones normally had colour display screens and provided high-speed data transfer and always-on connectivity. 3G mobile phones were designed to support large numbers of users more efficiently than 2G. Therefore, the emphasis on 3G technology was on providing data-centric services (such as

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[14] ELLIOT and PHILLIPS 2004, p. 5.
[15] Ibid., pp. 5–6.
[16] S. PATEL, H. PUROHIT and S. SHAH: *Review On 5G Wireless Technology, International Journal of Scientific Research in Computer Science. Engineering and Information Technology.* Volume 3, Issue 3, 2018. p. 1618.
[17] ELLIOT and PHILLIPS 2004, p. 5.

the mobile internet) with enhanced voice and multimedia capabilities. 3G technologies were first introduced to Japan in 2001 and spread to Europe and the USA in 2002. [18]

However, some authors suggested that in the next decad, mobile wireless technology had evolved from 1G to 5G generations.[19]

The 4th generation wireless network is a packet switched wireless system with wide area coverage and high efficiency. 4G is a more cost-effective and high-speed network. This network has a low cost per bit and good spectral efficiency. The 4G wireless network provides a high quality of service and high security, although battery consumption in 4G is high.[20] With rapid growth, particularly in the emerging markets, 4G will be the dominant mobile technology, exceeding half of the world's mobile network in 2019 and reaching 60% in 2023.[21]

Meanwhile, 5G is now a reality. Although 5G will take some time to reach critical mass, some markets show relatively rapid growth, e.g. People's Republic of China, South Korea, USA and Japan.[22] The goal of 5G is to have far higher speeds available, at higher capacity per sector, and at far lower latency than 4G. 5G promises a smarter, faster, and efficient network. 5G includes the latest technologies such as cognitive radio, Internet of things, nanotechnology, and cloud computing.[23]

The need of today's world is a novel technology which is affordable in cost with higher throughput, better coverage and capacity.[24]

2. Definition of mobile commerce

Basically, mobile commerce defined as the subset and as the next generation of e-commerce allows users to shop on the Internet through mobile and wireless networks. As mobile commerce is not only one of the ways communication instruments, but also it involved the technology, the markets and the consumers, some author supposed that mobile commerce is the new way of consumerism and is a more powerful form of communicating with customers. Mobile commerce is not just a new distribution channel, mobile internet or PC replacement. Rather, it's a new aspect of consumption and a much more efficient way to communicate with customers.[25]

Some authors argue that the popularity of mobile commerce cannot be measured by the popularity of mobile devices, since the popularity of e-commerce cannot, as has been proven, measured by the popularity of computers. Mobile commerce goes far beyond the

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[18] Ibid., p. 7.

[19] G.R. PATIL and P.S. WANKHADE: *5G Wireless Technology. International Journal of Computer Science and Mobile Computing*. Vol. 3, Issue 10, 2014. p. 203.

[20] PATEL, PUROHIT and SHAH 2018, p. 1619.

[21] *Mobile Economy Report.* London, GSM Association, 2019. p. 4.

[22] Ibid., p.4

[23] K.G. EZE, M.N.O. SAIKU and S.M. MUSA: *5G Wireless Technology: A Primer, International Journal of Scientific Engineering and Technology.* Volume No. 7, Issue No. 7. p. 63.

[24] A. KUMAR, A. ASWAL and L. SINGH: *4G Wireless Technology: A Brief Review, International Journal of Engineering and Management Research.* Volume-3, Issue-2, 2013. p. 42.

[25] J.J. ZHANG, Y. YUAN and N. ARCHER: Driving Forces for M-commerce success, Journal of Internet Commerce. 2001, p. 1.

limits of mobile telephony, meaning that a substantial volume of mobile commerce should not be seen as an obvious outcome of high penetration rates of mobile phones.[26]

In order to understand the convergence of electronic commerce and mobile commerce, it is imperative to understand the concept of e-business and mobile business. The term "commerce" in the article refers to the sale and purchase of goods and services in both the business and consumer segments, as well as acts directly related to those transactions. The term "business" refers to all activities that a company carries out with the aim of producing and selling goods and services. The term "commerce" therefore, is understood as an integral part of the broader concept of "business". Accordingly, e-commerce is considered an integral part of e-business.[27]

The adjective "electronic", used within the specific contexts of "e-business" or "e-commerce", signifies an "anytime and anywhere access" to business processes. The access to computer networks is in this case stationary. The adjective "mobile", used within the specific contexts of "m-commerce" or "m-business", signifies an "anytime and anywhere access" to business processes through portable devices.[28]

Generally, mobile commerce and mobile business are used reciprocally and mobile commerce is defined as any transaction with monetary value – either direct or indirect – that is conducted over a wireless telecommunication network.[29]

M-Business is defined as the exchange of goods, services, information and knowledge through mobile technologies. It includes various types of mobile activities: from communicating with colleagues via e-mail to receiving product information via SMS notifications and transferring customer orders via wireless PDAs.[30]

At this stage, it would also be useful to distinguish between the terms "mobile" and "wireless". Unlike the term "mobile", which means "access at any time and in any place" to computer switched networks, "wireless" is only one method of communication between electronic devices, for example, using infrared interfaces.[31]

Due to the wireless technology innovation, the scope and character of the traditional electronic commerce extend. These interactions are involved by providing additional features of mobility (of participation) and portability (of technology). Therefore, mobile commerce is sometimes introduced to as mobile e-commerce. Moreover, mobile commerce can be noted to be a flexible solution to many of the negative aspects of fixed-wired e-commerce.

In order to understand the nature of mobile commerce and explore its capabilities, Zhang and Yuan suggested analyzing the main differences between mobile commerce and electronic commerce over the Internet in three principal ways: 1) technology, 2) the nature

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[26] B. ANCKAR and D. D'INCAU: *Value-Added Services in Mobile Commerce: An Analytical Framework and Empirical Findings from a National Consumer Survey,* HICSS '02 Proceedings of the 35th Annual Hawaii International Conference on System Sciences (HICSS'02)-Volume 3 - Volume 3, 2002. p. 86.

[27] R. TIWARI, S. BUSE and C. HERSTATT: *From electronic to Mobile Commerce: Opportunities through technology convergence for Business services,* Asia Pacific Tech Monitor, Vol. 23, No. 5, 2006. p. 39.

[28] Ibid., p. 39.

[29] S. KIM, E. SUH and K. YOO: *Ubiquitous Computing based mobile commerce: Toward the ubiquitous commerce,* The Fourth International Conference on Electronic Business, Beijing, 2004, p. 87.

[30] R. TANDON, S. MANDAL and D. SAHA: *M-commerce issues and challenges, In International conference on High performance Computing,* India. 2003. p. 1.

[31] TIWARI, BUSE and HERSTATT 2006, p. 39.

of services and 3) business models. Understanding technological differences help us to determine what can and cannot be done in mobile commerce. Understanding the nature of service differences helps us determine which types of services are more suitable or not suitable for mobile commerce. Understanding the differences in the business model helps us to identify the source of income and the cost structure of mobile commerce.[32]

Mobile e-commerce (also called mobile commerce or m-commerce) is defined as all activities related to a (potential) commercial transaction conducted through communications networks that interface with wireless (or mobile) devices.[33]

At the same time, some author defines mobile e-commerce as any type of transaction of an economic value that is conducted through a mobile terminal that uses a wireless telecommunications network for communication with the e-commerce infrastructure.[34]

I. Clarke refers that mobile commerce, or m-commerce, is the ability to purchase goods anywhere through a wireless Internet-enabled device and concerns to any transaction with monetary value that is conducted via a mobile network.[35]

Mobile commerce (commonly referred to as 'M-commerce') is concerned with the use, application and integration of *wireless* telecommunication technologies and *wireless* devices within the business systems domain.[36]

Wireless e-commerce (also called mobile commerce or m-commerce) is the promotion, buying, and selling of goods and services through electronic data communication networks that interface with wireless (or mobile) devices.[37]

H.K. Lamptey implies that mobile commerce is an addition to the existing commercial transactions (marketing) that take place electronically.[38]

P. Sandhu suggests that definitions formulated in the initial phase of mobile commerce, do not seem to be appropriate today, even when they provide useful insights for understanding mobile commerce. So mobile commerce should be defined as any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device.[39]

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[32] J. ZHANG and Y. YUAN, M: *Commerce versus Internet-based E-commerce: The key differences*, AMCIS 2002 Proceedings., p. 1892.

[33] P. TARASEWICH, R. C. NICKERSON and M. WARKENTIN: *Issues in Mobile E-commerce, Communications of the Association for Information Systems*, Volume 8, 2002. pp. 41–42.

[34] A. TSALGATIDOU and E. PITOURA: *Business models and transactions in mobile electronic commerce: requirements and properties*, Computer Networks, vol.37, 2001, p. 221.

[35] I. CLARKE: *Emerging value propositions for M-commerce,* Journal of Business Strategy, vol 18(2), 2001. p. 41.

[36] G. ELLIOTT and N. PHILLIPS: *Mobile Commerce and Wireless Computing system, Harlow, Pearson Education,* 2004. p. 3.

[37] TARASEWICH, NICKERSON and WARKENTIN 2002, p. 42.

[38] H. K. LAMPTEY: *Mobile Commerce in Developing Countries: An Evaluation of selected articles published between 2009 and 2015*, Science and Technology, volume 8(1), 2018. p. 19.

[39] P. SANDHU: *Mobile Commerce: Beyond E-Commerce, International Journal of Computer Science and Technology,* volume 3, issue 1, 2012. p. 759.

P. May defines mobile commerce as a technology-enabled phenomenon, but sustained success in mobile commerce is a business issue. The business has migrated to the electronic channel; mobile extends the electronic channel.[40]

It is essential to understand mobility before examining any deeper into the mobile commerce definition. Mobility can be described in a number of ways. One could call cordless telephones mobile devices because they are wireless. On the other hand, a cordless user cannot leave the vicinity of their home (that is, the cordless base station), which limits the range and therefore, possibly limits the device's utility.

Mobility has the following attributes:
- call delivery to a mobile subscriber
- roaming-supporting calls to and from visiting subscribers
- authentication-is the process of user identity confirmation
- validation-verifies the "permission" to complete the call.
- handoff-is the process of reassigning subscriber handsets to specific radio channels
- path Minimization-efficient routing of a mobile call.[41]

Furthermore, with the help of wireless technology mobile computing and mobile commerce become the commercial magnet for business industry. That's why we have to keep in our mind the three main technology foundations of mobile computing: 1. mobile devices, 2. mobile operating systems and software, and 3. wireless networks.[42]

1. Mobile devices: constant innovation blurred the borders of mobile computing devices differences, so it is difficult to categorize end users devices. As technology develops some of the mobile devices became irrelevant, but on the other hand, the new devices appear in the marketplace industry.

Mobility started when computers became transportable. Laptops computers are significantly lighter and more practical. Several variations are available: standard laptops and desktop replacements. Notebooks are smaller, but less powerful than standard laptops. Netbooks (mini-notebook, ultra-portable) designed for Internet access and cloud computing. Ultra-thin laptops serve the needs of users who need very light and thin computers. Tablet computers were originally used to describe a portable PC, similar to a notebook device. Recently the term tablet used as the synonymous of the Apple iPad, in which the keyboard functions perform the touch screen or styles. That's why these smaller devices were originally called slates in order to differentiate them from the tablet computer with the swivel hinge. Other laptop variations include the UMPC (ultra-mobile personal computer), smartbook (combines features of a netbook and a smartphone), gaming laptop, and rugged computers, designed for industrial settings or for use in challenging climatic conditions.

The first modern cell phones/smartphones were created by researchers at Motorola in the mid-1970s. Since that time, mobile phones changed their size from large to small and become powerful networked systems.

[40] P. MAY: *Mobile Commerce: Opportunities, applications, and technologies of wireless business, Cambridge*, Cambridge University press, 2001. pp. 4-10.
[41] P.J. LOUIS: *M-commerce crash course*, New York, McGraw-Hill, 2001. pp. 210–211.
[42] TURBAN, VOLONINO and WOOD 2013, p. 194.

Since mobile devices appeared in the market, you can use it from anywhere and anytime, without any restrictions. That's why it there is no wonder why Wroblewski called the way of mobile devices using as "one eyeball and one thumb". "One thumb"- because you use your phone on one hand and control with one thumb. "One eyeball"- it means if you have a mobile at hand then you have people's partial attention. While mobile devices have constraints, they additionally have technical capabilities which help focus and simplify mobile experiences.[43]

Google's Project Glass is a new kind of mobile device in the early stages of development. Users wear a hands free-device similar to a pair of glasses that runs voice-activated, network-based applications. On the surface, it appears this product concept is the ultimate mobile device.[44]

2. Mobile operating systems and software: there are three dominant PC operating systems (OSs): Microsoft Windows, Apple, and Linux. The following list briefly describes the most popular mobile operating systems: 1. Android OS (Google/Open Handset Alliance). Android is the most popular operating system. 2. iOS (Apple, Inc.). Formerly called the iPhone OS. 3. Symbian (Symbian Foundation). 4. Blackberry (RIM). 5. Other Mobile OSs, like Windows Mobile (Microsoft), Palm (Palm, Inc.), and Bada (Samsung)

3. Wireless networks: based on mobile devices network, mobile commerce weakens the chains of commerce since consumers now carry access points with them and they can always connect to the networks. Although mobile commerce grows rapidly and surprisingly, it affects not only the overall users but also the modern business. Hence that's why mobile commerce is still a term that must be examined in its entirety and analyse its trends and opportunities for the future.

Mobile commerce is a new innovation in the electronic market. Therefore, many firms have been very sceptical about the potential of mobile commerce and have not yet examined it. However, issues and challenges regarding mobile commerce are very different and depend on how its markets developed. For instance, mobile commerce in the US is involved in assessing the technological evolution and the potential market growth, whereas mobile commerce in Europe focuses on a socio-economic analysis of the new market evolution. Hence, studies have found different issues and challenges between the two different mobile commerce markets.[45]

Encouraged by the increasing saturation of mobile technologies such as phones and PDAs, mobile commerce promises significant changes in the way certain activities are performed.[46]

Despite the fact that European and US markets differ from each other in the terms of issues and challenges of mobile commerce, it is clear that in order to develop the mobile commerce all these issues have to be discussed. So if the firms want their mobile commerce system to be more successful they have to be aware of the solutions and decisions of the earlier discussed issues and problems. Combining mobile commerce, the Internet and

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[43] L. WROBLEWSKI: *Mobile First*, New York, A Book Apart, 2011. p. 25.
[44] E. TURBAN, L. VOLONINO and G.R.: *Wood, Information Technology for Management: Advancing sustainable, profitable business growth*, New York, John Wiley & Sons, Inc., 2013. p. 195.
[45] S.H. KIM: *Impact of Mobile Commerce: Benefits, technological and strategic issues and implementation*, Journal of Applied Sciences 6(12), 2006, p. 2524.
[46] OREKU 2013, p. 85.

mobile phone can lead to more technical and strategic problems. For example, technical problems should be applied to solve problems such as speed and strategic plans and implementation plans should be made to solve mobile trade problems in terms of marketing. Therefore, recognizing the problems and solutions of mobile commerce should be a strategic core for many mobile trading companies.[47]

In terms of business models, mobile commerce includes relations between customers, operators, e-commerce providers, payment providers, and other parties.[48] In very simple terms, one can say that mobile commerce = electronic commerce + wireless web.[49]

Figure 1
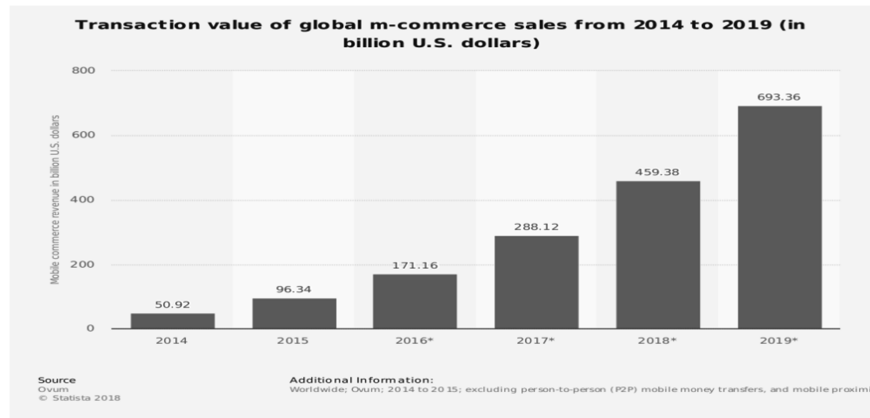
This statistic information presents the projected global mobile commerce transaction value from 2014 to 2019. According to the source, worldwide mobile commerce revenues amounted to 96.34 billion U.S. dollars in 2015 and are set to surpass 693 billion U.S. dollars in 2019.[50]

Sometimes there are obstacles for users to specify the meaning of mobile commerce, mobile e-commerce, mobile retailing and mobile marketing. However, these four terms are not mutually exclusive. Mobile e-commerce, Mobile Retailing, and Mobile Marketing are all forms of mobile commerce. In mobile e-commerce, the main process includes using mobile apps and mobile website in order to provide the transactions, but this interaction does not require traditional retail stores. Contrary to this in mobile retailing the whole process concerns about using mobile devices, in addition, this can include the orders carrying out with a website or mobile app. Mobile marketing term uses to express promotional strategies and tactics, in order to boost mobile e-commerce and mobile retail.[51]

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[47] KIM 2006, p. 2524.
[48] F. LEHNER and R.T. WATSON: *From E-commerce to M-commerce: Research Direction,* Working Paper Lehrstuhl fuer Wirtschaftsinformatik der Universitaet Regensburg, 2001. p. 2.
[49] TANDON, MANDAL and SAHA 2003, pp. 1–4.
[50] Statista.com
[51] TURBAN, VOLONINO and WOOD 2013, p. 199.

Hence, mobile commerce is succinctly defined as the interconnection of portable computing technologies, and the wireless telecommunications networking environments necessary to provide location independent connectivity within the business information systems domain.[52]

3. Unique features of mobile commerce.

Mobile commerce can be considered as an outcome of the merging of two technologies such as information technology (IT) and telecommunication technologies (TCT) by using wireless media. However, mobile commerce has some unique features and location-based services that cannot be applied to e-commerce. Due to these features and by the convergence of these technologies mobile commerce regarded as a subset of electronic commerce.[53]

One of the most important values of mobile commerce is reaching customers from suppliers and employees, no matter where they are. As a result, mobile commerce has some special features that are not available in traditional e-commerce:[54]

Ubiquity: Due to this feature mobile users can be available anywhere. It means that now users can carry commercial transactions independently regardless of their geographic location. As well as new mobile applications are used by mobile users, it also opens the door to the borderless communication that can make users from wherever and whenever they want or need. For example, they can be simultaneously available both at the meeting and receive information from through internet-enabled mobile devices.

Convenience (Immediacy): By using this opportunity the mobile users will have not to wait in long queues as there were not be any constraints regarding the time and the place of mobile devices. Moreover, the consumers now can use the services and buy the goods whenever they need, such as between the traffic jams. The business entities also have to react in a short time in order to provide intense service to the consumers' needs and also try to keep their client base.

Localization: Knowing the physical location of mobile users also combines avails regarding the use of mobile commerce. Mobile users can get any information (from eating to hiking) in the scope of their current locations through GPS enabled mobile devices. In addition, some vendors due to this advantage now can provide various services related to the consumer's current locations, like promote their services in specific areas. From the user's position, this feature accelerates key value status of mobile commerce over traditional e-commerce. It will also help users to find nearby places, such as restaurants or ATM around their current location.

Personalization: Since the mobile device has only one user, it is supposed that this device has been attached to the user's personality. Mobile devices have been determined as "one to one" device, so it obvious that all services, information and mobile applications will be based on the preference of the users. Essentially now mobile browsers will be dependent

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[52] G. ELLIOTT and N. PHILLIPS 2004, p. 3.
[53] TIWARI, BUSE and HERSTATT 2006, p. 39.
[54] E-P. LIM and K. SIAU (Eds): *Advances in Mobile Commerce technologies*, London, Idea Group Publishing, 2003, pp. 2–3. Clarke, 2001, p. 45.

on the user's need and choices, that's they have to be ready for targeted requests and groups. In this case from the user 's perspective, it means that all the delivered content through mobile devices have to be more relevant and personalized to the users' needs. Users can also choose services, information, contacts and applications related them anywhere and anytime with their mobile devices. In this occasion, mobile devices become the personalized database and provide personalized services. One example is the SIM (Subscriber Identification Module) smartcards which serve as the mobile database and let the users run applications and operate secure transactions.

Dissemination: Some wireless infrastructures support the simultaneous delivery of data to all mobile users in a given geographic region. This feature provides effective tools for disseminating information to a large number of consumers.[55]

Due to its unique features, mobile commerce can be considered as the new advanced technology and the next generation of e-commerce.

4. Mobile commerce applications

A good mobile application should not only be ergonomically simple, but also provide the consumer with sufficient, up-to-date and personalized information. The industry must use and reinforce these demand drivers by developing unique sets of innovative mobile applications that seamlessly interact with consumers and their environment.[56]

Although there are many potential mobile commerce applications, their successful implementation is a challenge. Many factors can affect the success or failure of mobile commerce applications.[57]

Technological excitement and unrealistic consumer expectations raised high hopes for innovative mobile applications that are unimaginable in the early stages. In many cases, there are gaps between potential applications and real services of leading mobile operators.[58]

One of the key factors of forcing mobile applications is a mobile commerce and mobile user which get benefits from using the content. However, there are several differences between web-based and mobile applications, in the term of the device itself, the network, the user and usage of the content. To begin with, mobile devices have a small display with relatively different size in a small shape rather than traditional electronic commerce. Mobile also has some constraints on input possibilities, memory, bandwidth and data transfer rate and they are costly than web-based applications. That's why mobile devices have been using for limited purposes.

At the same time, the network of mobile applications users also diverges from web-based applications. Majority of computer users at least know how to use it, while the mobile device users are not necessarily familiar with the theme and are more impatient in the using.

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[55] LIM and SIAU (Eds) 2003, p. 3.
[56] P. MAHATANANKOON and J. GARCIA: *Mobile Commerce Adoption barriers,* Encyclopedia of Mobile Computing and Commerce, 2007. p. 461.
[57] T-P. LIANG and C-P. WEI: *Introduction to the Special Issues: Mobile Commerce Applications,* International Journal of Electronic Commerce, volume 8(3), 2004, p. 8.
[58] MAHATANANKOON and GARCIA 2007, p. 461.

Another difference regarding the mobile and web services are using the content. As the mobile services frequently are used like "on the move" therefore the users are not able to concentrate on situations and get distracted.[59]

B. Anckar and D. D 'Incau argued that the learning curve for mobile commerce is much faster than for other information and communication technology (ICT) application services and that mobile commerce applications are likely to be more user-friendly than corresponding PC applications.[60]

In fact, mobile commerce is not simply a new distribution channel, a mobile Internet or a substitute for PCs. Mobile commerce applications have their own unique features: mobile communication, personal touch, location-related and time critical services.[61]

In general, mobile commerce applications have two main features: mobility and reachability.[62]

These two characteristics have created several value-added attributes that drive the demands for mobile-based computing, such as convenience, instant connectivity, and personalization. These interrelated factors are transforming the telecom industry from the provider of products or services to the mediator of the socio-psychological needs of customers. The success of mobile commerce depends on the synergy of technological innovation, the development of new value chains and active customer demand.[63]

With the same ideology, these two dimensions can be adjusted to provide the basis for mobile commerce applications: measuring the extent to which mobile technology capabilities meet the requirements of the task, and measuring the viability of the environment or organization for which summaries are being prepared.[64]

These attributes can, in turn, be divided into the following six categories:[65]

Time-Critical Services: This category of applications uses the reachability features of mobile users for emergency and time-critical services. For example, notifications or SMS-based alerts (for example, changes in airline flight schedules, stock pricing alerts, home burglary alerts) give users a time-critical value.

Location-Aware and Location-Sensitive Services: The ability to identify the location of a mobile user or moving target at a particular point also creates significant value for mobile services. If the required location information is available, services may be provided based on location-aware or location-sensitive services. The location-aware service is a service for which information about the location of the moving targets is important to the provision of this service. The location-sensitive services rely on the location information about moving targets for delivering "relevant" and "appropriate" services.

Identity-Enacted Services: Mobile devices can also be used to identify users. Examples of identity-enacted services are mobile financial applications (eg, mobile banking and

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[59] H. OINAS-KUKKONEN and V. KURKELA: *Developing successful Mobile Applications*, 2003, p. 4.
[60] ANCKAR and D 'INCAU, 2002, p. 86.
[61] M. CHOUDHURY and I. SRIKANTH: *A Comparative Study On "E-Commerce Verses M-Commerce: The Future of Online Marketing"*, National research Journal of Sales & Marketing Management, Vol-1(2), 2014. p. 2.
[62] LIANG and WEI 2004, p. 8.
[63] MAHATANANKOON and GARCIA 2007, p. 461.
[64] LIANG and WEI 2004, p. 8.
[65] Ibid, p. 8.

brokerage services, mobile money transfers, mobile micropayments) that enable customers to conduct financial transactions.

Ubiquitous Communications and Content Delivery Services: Mobile communication allows personal contact anytime and anywhere. Although voice and text messaging are currently the most important forms of mobile communications, future mobile devices, such as 5G phones, can process much more information and provide more bandwidth.

Business Process Streamlining: Mobile services can also be used to improve the efficiency of business processes that involve location-sensitive or time-critical actions to reduce operating costs or improve service quality.

Mobile offices: Mobile devices can be used in offices. Using mobile devices, office productivity can be improved. Mobile workers (i.e., workers with mobile applications) can extract critical information from the switching system, execute order assignments, plan and send, and collaborate with others (mobile or not) in a wireless environment.

According to U. Varshney et al., in order to strategize and create mobile applications mobile commerce consist of the frameworks. Generally speaking, the frameworks can not only simplify the design and development, but also provide a developer-provided plane, which addresses the different needs and views of application developers, content providers, and service providers. He suggests 4 frameworks like 1. mobile commerce applications; 2. wireless user infrastructure; 3. mobile middleware and 4. wireless network infrastructure.[66]

1. Since there is a potentially unlimited number of applications for mobile commerce, the author tried to identify the several classes of application and suggested these subsections, like mobile financial applications, mobile advertising, mobile inventory management, proactive service management and other applications.

Mobile finance applications are likely to become one of the most important components of mobile commerce. They can include various applications, such as mobile banking and brokerage services, mobile money transfers and mobile micropayments. These services can turn a mobile device into a business tool that replaces bank, ATM and credit cards, allowing the user to make financial transactions with mobile money.

Mobile advertising is also a very important class of mobile commerce applications. Due to the demographic information collected via wireless service providers and information about the current location of mobile users very targeted advertising can be done.

Mobile inventory management (MIM) involves location tracking of goods, services, and possibly even people. Proactive service management (PSM) is based on collecting pertinent information about current or near-future user needs and providing services to users proactively.

2. In order to make the applications describe reality, you need several functional components. An important area includes mobile devices with sufficient performance in terms of memory, display and communication functions. If it is difficult to work with user interfaces, the user may not see significant value in mobile commerce applications. While transferring information out of context to users, many of them may not find the experience

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[66] U. VARSHNEY, R. VETTER and R. KALAKOTA: *Mobile Commerce: A new frontier*, Computer volume 33(10), 2000. p. 32.

of mobile commerce very enjoyable. If location-based services cannot be used in specific locations, it may affect whether users accept such applications.

3. As a general rule, middleware traditionally integrates various applications, tools, networks and technologies, overall allow users access through a common interface. Mobile middleware can be defined as a stimulating software layer that allows application developers to connect their mobile commerce applications to different networks and operating systems without providing mobility awareness in the applications.

4. In addition to mobile devices and middleware, network support for wireless networks is critical to implementing mobile commerce applications. Significant advances have been made in wireless and mobile networks in recent years in terms of protocols, standards, technology, service quality and user acceptance.

U. Varshney et al., believe that user trust will play a critical role in the adoption and dissemination of mobile commerce applications.[67]

Unlike websites, mobile applications offer key advantages to both retailers and consumers. For example, retailers can increase the value of their customers' purchases by developing loyalty programs that work through their applications and then through the devices of the customers themselves, if they agree to the terms. For retailers, mobile apps are helping to increase brand awareness by appearing in the ecosystem of customers' mobile apps.[68]

The framework must consider the task requirements, technology, and the environment in which the technology is applied. To this end, a two-dimensional matrix can be modified that uses fit and viability to evaluate Internet investment portfolios. In other words, it is necessary to identify the factors that influence the success of mobile commerce applications and develop recommendations for assessing the potential of certain applications.[69]

Conclusion

A number of government measures, such as the liberalization of the telecommunications market, the licensing of new mobile operators or the creation of an independent regulatory body will help to create an honest and competitive market for mobile commerce. National governments should encourage the adoption of guidelines and rules for authentication, security and privacy.

The mobile industry is urging governments to set incentive strategies for 5G and reform the regulatory framework that is no longer appropriate for today's digital economy. The first priority is to allocate a sufficient spectrum for 5G. Compared to previous mobile

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[67] U. VARSHNEY and R. VETTER: *Mobile Commerce: Framework, Applications and networking support,* Mobile Networks and Applications 7, 2002. p. 13.
[68] 2017 Mobile Commerce Outlook Report 2017, p. 6.
[69] LIANG and WEI 2004, p. 8.

generations, 5G requires larger contiguous blocks of spectrum. In addition to 5G, most countries still need to modernize the regulatory framework for the mobile sector. The world has changed, and regulation must keep up with the times. The authorities need to consider two key areas in the review of the reform: First, the regulatory framework needs to be reviewed and updated to promote market dynamics, competition and the well-being of consumers. Secondly, governments must reduce the tax burden on certain sectors in order to stimulate investment in new technologies. By creating the right regulatory framework, governments create incentives for technological innovation and investment that can benefit society as a whole.[70]

As we move toward a more hyper-connected world of ubiquitous personal technology, mobile commerce is poised to become an even more profound economic and social phenomenon. The proliferation of smart handheld devices is causing and reflecting changes in society at the same time. As people increasingly rely on the Internet to get everything they need, from shopping to social networking, they need constant access to it while they're on the move. This will undoubtedly lead to an increase in the demand for personal technology and mobile commerce and will inevitably lead to certain consequences for our lives, such as blurring the boundaries between our personal and working hours. After all, do not underestimate the social future of mobile commerce. Different forms of social networks (social networking platforms, microblogging applications, etc.) rightly attract the attention of researchers and practitioners.[71] Finally, improving communication with the Internet backbone is crucial if mobile commerce wants to fully realize its promise of connectivity for all.[72]

Mobile commerce has great potential to push global trade and trade across geographic borders. However, at present, this huge potential is limited by various perspectives of strategies and implementations of mobile commerce in different regions of the world, as well as the adoption of different mobile communication standards and

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[70] Mobile Economy Report 2019, p. 5.
[71] P.E. KOUROUTHANASIS and G. GIAGLIS: *Introduction to the Special Issue Mobile Commerce: The Past, Present, and Future of Mobile Commerce Research*, International Journal of Electronic Commerce, 2012. p. 15.
[72] United Nations Conference on Trade and Development 2002, p. xxi.

NARMIN MIRIYEVA

A MOBIL KERESKEDELEM, MINT AZ E-KERESKEDELEM ÚJ GENERÁCIÓJA

(Összefoglalás)

Az internetes kereskedelmi tranzakciók száma ugrásszerűen megnőtt az utóbbi években. Nagy részüket mobilapplikációkon vagy más innovatív online platformokon keresztül bonyolítják le. Az új technológiák gyors elterjedése miatt a piac fordulóponthoz ért. Egy internethozzáféréssel rendelkező okostelefon vagy tablet használatával ugyanis megszűntek a hagyományos térbeli és időbeli korlátok, ma már bármit el lehet intézni, akár út közben is. Az új mobil eszközök és szolgáltatások rohamos fejlődése nem csak az egyéni szokások gyökeres változását hozta magával, hanem egyúttal az egész kereskedelmi rendszerre jelentős hatással vannak.

A mobiltelefonon keresztül történő adás-vétel mára az elektronikus kereskedelem (e-kereskedelem) meghatározó elemévé vált. A mobil kereskedelem (m-kereskedelem) a fogyasztás egy új aspektusa és egyben a vásárlókkal való kommunikációnak egy még hatásosabb módja. Ugyanakkor ma már nem csak a vásárlók elérésére használják ezeket az eszközöket és szolgáltatásokat, hanem a vállalkozások belső szervezeti stratégiájának is az egyik legfontosabb részét képezik.

Jelen tanulmány átfogó képet ad a mobil eszközök, az m-kereskedelem fejlődéséről és mai helyzetéről. A mobil kereskedelem és az ezzel szorosan összefüggő fogalmak meghatározását követően a szerző bemutatja az üzleti- és közösségi életben használatos mobilapplikációk jellegzetességeit, és segítséget nyújt a csoportosítási szempontok felállítását, valamint - a legújabb generáció (5G) miatt szükségessé vált - az egész mobil szektort érintő szabályozási reform lehetséges irányait illetően