

Determinants for a generic mobile commerce transformation framework

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Abstract

Current technological advancement has given the necessary impetus for businesses to transform from traditional ways into mobile business or m-businesses. This transformation has begun from the Internet era, where traditional businesses transformed to e-businesses by taking advantages of the facilities offered by the Internet. Recent development in wireless technology facilitated businesses to move further to m-businesses. Despite the development in the technical domain, it appears that businesses still struggle to comprehend the processes involved in the transformation because a proper framework is yet to evolve. This work-in-progress paper provides a background to such transformation with a method to achieve this transformation.

1. Introduction

Research firms such as Shop.org and Forrester Research, based on the growth rate of on-line retail sales, estimated that \$100 billion has been achieved in 2004, representing 4.5 percent of total retail sales. Business-to-business (B2B) e-commerce is expected to grow worldwide to \$4.3 trillion by 2005 according to International Data Corp (IDC) [13]. Due to the advent of wireless technology, it is believed that parts

of e-commerce will take place through wireless devices, and create a large market for many industries because wireless technology offers mobility and flexibility [28]. The mobile Internet is transforming employees, supply chains, and customer interactions by facilitating new innovations, cost-reduction, and revenue opportunities [9]. For example, PDAs support a wide variety of enterprise-level applications in fields ranging from industrial manufacturing to the airline industry to healthcare, and business and personal productivity applications range from document readers to street maps and vacation planners [11]. Carlsson indicates that cyber economy will combine traditional business with new e- and m-business, and will be driven by a new breed of online customers, who operate both wired and wireless networks, who will expect fast delivery, easier transactions and more fact-based information [2].

Even on its initial stage, mobile communication has produced high profit for Mobile Network Operators (MNOs) [16]. For example, NTT DoCoMo's Internet enabled i-mode service has more than 40 million subscribers [23], and each generating about \$26/month in additional revenue per user [10]. It becomes a showcase to the world on the many wonderful opportunities that existed within

the wireless industry. Therefore, mobile commerce (m-commerce), a new type of electronic commerce that consists of conducting transactions via mobile terminals, due to its inherent characteristics such as ubiquity, personalization, localization, and convenience, differs substantially from Web-based commerce in some technological components, has become an important part of the global commerce.

It appears that m-commerce is not included in the traditional e-commerce market models despite that fact that m-commerce will be able to increase the overall market for e-commerce, because of its unique value proposition of providing easily personalized, local goods and services anytime and anywhere [3, 4]. A reason for this may be due to the fact that mobile commerce followed e-commerce models and the lag in time. While discussing about e-business success factors, Porter argued that companies that use the Internet in conjunction with their traditional business models will improve their activities leading to success and the same argument can be applied to m-business as well [18]. Although mobile technologies can be helpful on internal business processes, like decision support, database applications and information service applications design [2, 8]. However, from web-based to m-commerce, innovation is architectural for customers and E-commerce companies [27]. Although some studies indicate there are difficulties for businesses to implement new wireless systems, and try to provide the suggestions for that [5], the overall

investigation and suggesting guidelines of business mobilisation process is not available until now. Therefore, it would be useful to provide a theoretical framework for businesses which want to move into m-businesses area. This has given the motivation for this study.

2. Literature review

Literature review in the study includes definitions of m-business; the potential and advantages of m-business; the previous studies of e-business transformation; and the future challenges.

Definitions of m-business

There are some definitions available for m-business and m-commerce. For instance, mobile e-commerce transaction is defined by Tsalgatidou and Pitoura 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’ [25]. Liao et al. define mobile commerce as ‘... involves the delivery of products and services via wireless technologies to enable e-commerce activities without restrictions of time and space’ [12]. Clarke states ‘mobile e-commerce, commonly referred to as m-commerce, is the ability to purchase goods anywhere through a wireless Internet-enabled device’ [3]. Terziyan defined mobile e-commerce as ‘a business transaction of an economic value that is conducted using a mobile terminal that communicates over a wireless telecommunications or personal area

network with the e-commerce infrastructure' [24]. Gunasekaran and Ngai defined m-commerce as any direct or indirect transactions involving monetary value can be called m-commerce as long as they are completed on wireless telecommunication networks [6], and Tarasewich et al. also give a similar definition to it [22]. Kalakota and Robinson claimed that m-business should combine Internet, wireless technologies, and e-business indicating that m-business includes aspects of information, services, and products with mobile devices on wireless network infrastructures [10]. Furthermore, Mylonopoulos and Doukidis defined m-business as 'an ecosystem of individuals and business actors, in given historical socioeconomic contexts, engaging in multiple successive technological frames through a learning process of co-creating new experiences of social interaction with the use of wireless and mobile technologies' [14]. They also explain m-business as 'a number of different industries (hardware, software, telecommunications, content provision, public organizations, etc.) in a process of convergence and competition toward a vague vision of a wireless future.' These definitions clearly indicate that the concept of mobility is central to m-business.

3. Potential and advantages of m-business

Mobile commerce can enhance business efficiency by distributing information to the workforce remotely, and offering new channels on which to interact with customers [11]. The distinction of m-business from e-business is based on the

value proposition attributes of ubiquity, convenience, localization and personalization [3]. While e-business provides convenience and personalization to some extent, m-business, due to the technology, provides specific advantages of mobility and localization. The ubiquity of m-businesses is derived from the mobile devices that offer users the ability to receive information and perform transactions from virtually any location on a real-time basis. The advantages presented from the omnipresence of information and continual access to businesses will be exceptionally important to time-critical applications. Convenience is realized in terms of agility and accessibility provided from wireless devices. This also allows m-businesses to differentiate its abilities from e-businesses. Localization of m-businesses is in terms of knowing the location of the user to create a significant advantage so as to leverage location-specific information by supplying information relevant to the current geographic position of the user. Personalization is achieved by making mobile devices ideal for individual-based target marketing. It offers the opportunity to personalize messages to various segments, based upon time and location, by altering both sight and sound. When these four elements are combined, the potential to improve the activities of a business becomes enormous.

For the Internet value-adding activities such as search, evaluation, problem-solving, and transaction, mobile technology also enhance the value by making them more

convenient and efficient [13]. In addition, a mobile service framework enables whole new levels of customer care, as well as new sorts of business opportunities [15]. Consequently, mobile business will be the main driving force for the next phase of electronic commerce growth because the rapid adoption of the mobile telecommunication systems has created a market opportunity of several hundred million consumers worldwide [19].

Also, Clarke presented the following reasons why mobile technology is beneficial for businesses: E-commerce applications that succeed on the desktop PC will not necessarily meet with a similar accomplishment in a wireless commerce; Industries that are time sensitive, such as financial services and travel, are likely to benefit from mobile commerce; The convenience of it offers tremendous opportunities to expand a client-base by eliminating some of the customers' labour of life's activities; Vendors can deliver promotions based on the user's location, and real time discounting may become the 'killer application'; Personalized information and transaction feeds (such as past behaviour, situation, profile), via mobile devices, offer the greatest potential for the customization necessary for long-term success [3]. Due to m-business is still in the initial stage, while analysing the advantages of m-business, the previously successful examples in e-business may be useful. One example is Intel. By deploying e-business system to enhance its distinctive positioning, operational efficiency, and competitiveness,

Intel has continued to strengthen its strategic position in the global market [17].

4. Previous studies of e-business transformation

Clarke indicates the managers must focus on three key issues and ask some critical questions before mobilising their company: Innovation and customer value, profitable business models, and focus and leadership [3]. He also believes the long term m-business success is likely to come from consumer-oriented, rather than technology-based strategies.

Based on the concept of Kalakota and Robinson, the mobile solutions should build on top of the e-business investments [10]. Therefore, the introducing experience gained from the transformation process of e-business may be a good reference for designing the m-business transformation framework. Siebel listed five steps for introducing e-business strategy: (1) Analyse current situation, and create the e-business vision. (2) Design multi-channel strategy for the vision. (3) Action plans development. (4) Introduce and launch e-business system. (5) Evaluate, monitor and trace the e-business strategy [21]. Moreover, they also provide eight reference principles to follow in the introducing process.

Kalakota and Robinson also addressed the guidelines for digitizing the business [9]. They divided the process into the following four steps: Self-diagnosis, reverse the value chain, choose a focus, and execute flawlessly. For the value chain redesign, Buellingen et al [1] also outline a more detailed and extended value chain for mobile

communication.

In addition to the frameworks, there are also other researchers provided their experience from different cases. Turban et al reference the previous study and list some major success factors for e-business [26]. These factors include technology issue, operational efficiency, strategy, cost control, employee education, and the support from top management. Another example is the lessons learned from Intel's e-business system development for competitive advantages. Phan summary they from strategic position, management support, best security protection, good project management, to the solid e-business architecture [17].

The design job of m-business transformation framework should absorb the previous knowledge getting from e-business adoption, and then take the characteristics of m-commerce into account. Of course, new experience gathering from mobile forerunners is equally important. The job is not as easy as just put 'mobile' in the front of each term. Integration of the Internet with mobility may require a re-engineering of some parts of their business [9]. There is not a generic framework for the m-business transformation process, either the determinants to evaluate the framework currently. Therefore, based on the previous knowledge in the related domains, this study tries to answer the questions such as 'How do businesses transform into m-businesses successfully, and what determinants can be used to evaluate a transformation framework?'

5. The future challenges

Many studies have addressed the difficulties and challenges for mobile commerce and the development of m-business. For examples:

Porter has emphasized that Internet technology becomes strategically significant only when its practical application creates new value [18].

Kalakota and Robinson think customer value creation will most likely occur in five solution phases based on continuous improvements in mobile technology [10]. These phases are messaging, info-connectivity, transactions, transformation, infusion. Mobile companies today are in Phase one. How quickly and completely the mobile Internet is adopted and used will be determined by how well the software applications it provides meet real customer needs.

If the phones are too expensive, if the telecom companies charge too much per minute, if the vendors' price their goods and services too high for impulse and convenience buying, then the cell phone may not turn into a product development success story [11].

Decision makers have a difficult task in assessing the range of proposed business models in order to determine those that are most suitable [7].

For those have transformed into e-business, the implications for managers failing to develop effective consumer-oriented m-commerce strategies may include: wasting company resources chasing the ever changing technological

environment, consumer alienation, and erosion of e-commerce market share [7].

Based on the literature reviewed, the following research questions have been developed to understand the transformation process of m-business.

What are the suitable ingredients to develop a model for m-business?

What are the challenges facing businesses while transforming to m-business from their current stage?

What factors impact the development of an effective framework in the transformation process?

What are the efficient strategies in realizing an m-business transformation?

6. Initial research model

While the previous models are useful starting points, they relate predominantly to e-businesses. As explained earlier, m-business is different from e-business and hence there is a necessity for a new model to transform businesses to this stage. An initial provisional model is derived from available literature for further refinement and testing as shown in the following diagram:

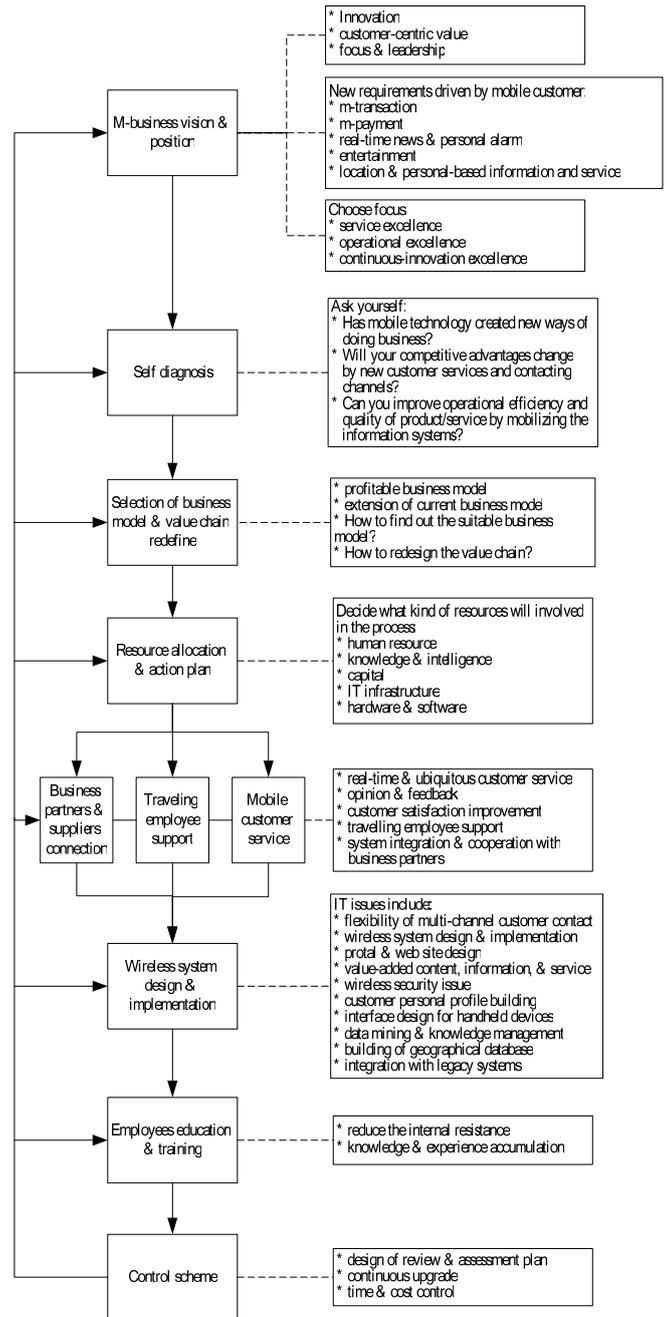


Figure 1 Initial research model

7. Research design and methodology

This study combines conceptual and empirical research methods. Conceptual research mainly focuses on the development of framework (step 1). On the other hand, empirical research emphasizes the findings of practical knowledge and successful

experience related to the m-business transformation process (step 2 & 3). The research for this project is carried out in three steps as follows:

Step 1- Focus Group (exploratory):

In this stage a focus group session will be conducted with a selected group of Australian stakeholders. The group will consist of academics and management practitioners from the Australian industry.

The focus group sessions will be conducted using the Group Support System (GSS) technology. GSS is a computer-based system used to support goal directed task of a group of people. A GSS session is facilitated by a team of two persons: a facilitator and a chauffeur who runs the computer system. Using GSS various aspects impacting m-business transformation will generated, discussed, and evaluated in a group environment. Zikmund defines a focus group interview as an unstructured, free-flowing interview with a small group of people [29, p.108]. One of the advantages is to let people spark off one another, suggesting dimensions and nuances of the original problem that any one individual may not have thought of [20, p140]. Therefore, using focus group interview on this stage may inspire the participants to each other for the challenges they may meet, as well as the potential solutions.

Step 2 – Literature Review (exploratory):

Extensive literature review will be carried out in this stage to integrate the findings of step 1 with the findings from the literature. The mediating factors will also

be found in this step and research model of figure 1 will thus be completed.

Step 3 – Survey (confirmatory):

To investigate more overall information, and further strengthen the outputs of previous steps, a survey is planned to be conducted among a random sample of professionals via a structured questionnaire in this step. The questionnaire will be developed based on the findings of stage 1 and the research model of Figure 1. Statistical tests such as regression analysis and Structural equation modeling (SEM) will be used to test the model of Figure 1. A tested and validated model will confirm the findings of step 1 of the research.

8. References

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