

Introducing an M-Commerce Course into the Business Management Curriculum: Experiences and Recommendations

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ABSTRACT

Mobility has become an important extension to the business strategies of present-day organizations. Thus, organizations are increasingly seeking managers with knowledge of value chain related to mobile-oriented business activities, usually referred to as mobile commerce (m-commerce). Accordingly, business management schools are interesting in designing their curricula to respond to the need for m-commerce knowledge and, in particular, the scope of the content for an m-commerce course. The general conception of m-commerce is that it is a component of e-business or e-commerce. This paper presents the unique dimensions of m-commerce that makes it stand out as a separate course for postgraduate business management students. This paper also provides input in regard to the design and delivery of the course by drawing upon the recent teaching experience of the authors at a highly respected business school in India. The course design covers mobility-related technology elements as related to business in diverse industry segments and is expected to enable students to develop a suitable mobile strategy for a real-time business scenario. The course content was drawn primarily from research papers, industry reports, and examples of trending mobile applications. The pedagogy was a blend of lectures and classroom exercises on innovative case studies. The response of the students to the course indicated a high degree of satisfaction in regard to its relevance. The inputs provided in this paper are believed to serve as guidance to business management schools that are interested developing such a course.

Keywords: M-commerce, Curriculum design and development, E-commerce or E-business

1. INTRODUCTION

The emergence of a relatively inexpensive and easy-to-use digital infrastructure in the recent past has led to the inception of several key technological trends that have transformed the way individuals live and work, how companies organize their business operations, and the structure of entire industries (Fichman, Santos, and Zheng, 2014). Mobility is one such technological trend. The convergence of the Internet and mobile communications, in particular, brought about a variety of wireless data communication capabilities, which led to a paradigm shift in the way that individuals communicate and work (Balasubramanian, Peterson, and Jarvenpaa, 2012; Scornavacca, Barnes, and Huff, 2006; Varshney and Vetter, 2002). In 2014, global smartphone users represented nearly

40% of all mobile phone users, or 25% of the global population. Mobile commerce (m-commerce) now accounts for 17.4% of total online retail sales year, and mobile sales are predicted to easily reach over USD113 billion, with a compound annual growth rate of 28%, by 2017 (Jones, 2013). Mobile services have become an important channel for businesses to reach customers, and businesses have been rapidly integrating mobile services into their business strategies.

Business students both at the graduate and undergraduate levels need to have strong grounding in the technological and business aspects associated with m-commerce. Knowledge of technological innovations such as m-commerce can help business students in two ways: (1) to effectively direct management and strategies related to m-commerce in organizations, and (2) to become digital innovators

themselves by conceiving and developing innovative organizational processes, products, and business models by matching the potential of m-commerce with unmet organizational or societal needs (Fichman, Santos, and Zheng, 2014). Business schools, however, face certain challenges with technology-related courses, such as those in m-commerce, as they update their curricula to reflect the current needs of the industry. First, the landscape of the technologies associated with m-commerce is constantly changing, and identifying the trends that can have a significant impact on businesses may be difficult. Second, based on this constant change, designing the curriculum and finding appropriate content becomes challenging. Finally, it is difficult to determine whether it is more appropriate to position m-commerce as a separate course or an extension of such courses as e-business and e-commerce.

In this paper, it is argued that m-commerce needs to be positioned as a separate course. The location specificity and the time criticality associated with mobile services result in unique opportunities and constraints to businesses, as compared to those of services delivered through wired e-commerce platforms. The technical and business interdependencies associated with delivering mobile services accentuate the need to treat m-commerce as a separate field. This paper also provides input into the design and delivery of an m-commerce course by drawing upon the recent experience of the authors in teaching this course at a highly respected business school in India. The response of the students to the course indicated a high degree of satisfaction with its relevance as a part of the curricula. The inputs provided in this paper are believed to serve as guidance to business management schools that are interested developing such a course.

The paper is organized as follows. The next section discusses the distinctive characteristics of m-commerce that reinforce the positioning of m-commerce as a separate course. The third section describes the design and delivery aspects of the m-commerce course based on the teaching experience of the authors with post-graduate business management students. The last section concludes the paper.

2. DISTINCTIVE CHARACTERISTICS OF M-COMMERCE

M-commerce includes activities related to commerce transactions, data access, and network services that are conducted through mobile devices using wireless communication networks and processed without any boundaries of time and space (Kuo and Yu, 2006). The emergent m-commerce space, as distinct from the established e-commerce space, has a number of differentiating characteristics in terms of the use context, usability, and value chain (Dholakia and Dholakia, 2004). These distinct characteristics are discussed in detail in the following sections.

2.1 Use Context

Mobile technologies have brought flexibility to several activities on the spatial or temporal dimension or on both (Verkasalo, 2009). In particular, these technologies have shifted the locations of several day-to-day activities, such as

watching a live sports match or buying a book, on the space-time matrix (Balasubramanian, Peterson, and Jarvenpaa, 2012). While these flexibilities offer businesses an opportunity to reach their potential customers in a personalized way, to take advantage of these opportunities, businesses need to understand the use context of mobile users (Balasubramanian, Peterson, and Jarvenpaa, 2012; Venkatesh, Ramesh, and Massey, 2003).

Many of the assumptions about user interactions that drive Web design do not hold true for the mobile space. The goals that mobile users are trying to achieve through m-commerce services are related to their stance in terms of time commitment, location, and role (Dholakia and Dholakia, 2004). Mobile service designers and developers must essentially recognize that users will not be sitting at a desk and looking at a big screen for substantial amounts of time in a relatively peaceful environment. Instead, they will be mobile, perhaps walking down the street or sitting on a train, using the mobile application (mobile app) in environments that contain diverse external stimuli (Madrigal and McClain, 2010). As such, there can be a significant number of additional people, objects, and activities that compete for the user's attention. Since the devices are completely mobile, this outside environment can change rapidly from moment to moment. Thus, the amount of attention that a user can give to a mobile app will vary over time, and the user's priorities can change dynamically with the diverse external stimuli (Dholakia and Dholakia, 2004).

Further, the small screen on which the mobile app runs carries less auditory impact and, therefore, is not as immersive and is less able to hold a user's attention than is a desktop or laptop (Madrigal and McClain, 2010). With such complexities in the users' environment, it is incumbent upon the application designers and developers to ensure that users are able to open the app quickly, accomplish what they want, then exit quickly and return their attention to the outside world (Madrigal and McClain, 2010). The relevance of the content presented, an easy-to-use structure (within the limited space available on the mobile screen), and personalization become even more important when designing the interface for a mobile service (Venkatesh, Ramesh, and Massey, 2003).

2.2 Usability

Usability is yet another factor that differentiates mobile-based applications from those based on desktop and laptop computers (Tarasewich, Nickerson, and Warkentin, 2001). Usability, in the case of m-commerce systems, is greatly influenced by the physical and technical characteristics of the mobile devices and their user interface, middleware, and the wireless mobile network infrastructure (Safari and Zissis, 2015; Varshney and Vetter, 2002). To enable portability and better energy consumption, hand-held devices necessarily have smaller screen sizes and lesser memory processing (Safari and Zissis, 2015). The designers and developers of the m-commerce applications need to take into account the technological restrictions of the mobile devices, including the smaller screen size, memory, and processing capabilities (Safari and Zissis, 2015). Moreover, they face many challenges due to the complexities involved in working with

a number of operating systems and devices with varying characteristics (Safari and Zissis, 2015).

Other challenges include content presentation and navigation. For example, mobile interface designers need to optimize the mobile interface for finger taps rather than mouse clicks. Correspondingly, hypertext links that are signature components of website pages are not amenable to or preferred for mobile screens due to the difficulty associated with opening the links (Tripathi, 2015). Navigation links need to be top-horizontal oriented for a mobile screen, in contrast to the left-vertical orientation used in webpages (Tripathi, 2015). Moreover, the many varieties of hand-held devices come with different screen sizes (Chang, Chen, and Zhou, 2009). Therefore, the design and development of an m-commerce application must adapt the structure and the content to these varying screen sizes (Rowles, 2014).

Mobile devices also are characterized by a unique synthesis of interaction affordances that can transform the user experience when compared to desktop platforms. These affordances include gesture-based, multi-touch interaction with digital content; location awareness and subsequent service and content adaptation; advanced sensing capabilities (with embedded devices, such as a gyroscope, GPS, camera, and Bluetooth); multimedia (photos, sound, and video) capturing; and sharing (Ferreira, Kostakos, and Dey, 2012; Safari and Zissis, 2015). Therefore, m-commerce application development requires a new way of thinking with respect to interaction design and software development. Although the mobile environment provides opportunities for enhanced use experience, it also poses constraints for the developers based on such issues as limited memory and processing capabilities.

Another aspect of mobility that has implications for the usability of m-commerce applications is the continuous change in locations of a mobile user across multiple wireless networks. As users move to different locations while using an m-commerce application, mobile devices interface with different communication environments that have different levels of location accuracy, response time, and transaction rate (Varshney and Vetter, 2002). Maintaining connectivity and security of the information across the networks is one of the important issues that influence the usability of m-commerce applications (Tarasewich, Nickerson, and Warkentin, 2001). Middleware and encryption technologies have an important role in addressing these issues. Middleware can be used to regulate the amount of information processing required for a device, the amount of information that needs to be transmitted over wireless networks, and the level of security for m-commerce transactions (Varshney, Vetter, and Kalakota, 2000). Identity verification, which is a challenging task in the mobile environment, can be achieved by the use of encryption technologies and biometrics (Tarasewich, Nickerson, and Warkentin, 2001). Assessing the complexities and costs associated with incorporating relevant middleware and encryption technologies is of paramount importance while designing and developing a mobile service.

2.3 Value Chain

The m-commerce value chain is an aggregation of the traditional mobile telecommunication value chain and the Internet, with the most complicated composition of members and close interactions (Kuo and Yu, 2006; Maitland, Bauer, and Westerveld, 2002). This represents the two-sided market phenomenon whereby one or several platforms enable interactions between users and try to get the two sides “on board” by appropriately charging each side (Wang and Lu, 2008). The m-commerce value chain essentially consists of six components associated with content and infrastructure services, namely content creation, content packaging, market making, mobile transport, mobile services and delivery support, and mobile interface and applications (Barnes, 2002). This value chain is a complex network of players, including technology platform vendors, infrastructure and mobile equipment vendors, application platform vendors, application developers, content developers, content aggregators, mobile portal providers, 3G mobile network operators, mobile service providers, and mobile equipment retailers (Kuo and Yu, 2006). The multiple interactions among these players are not necessarily sequential; rather, all market players need to contribute for the m-commerce industry to reach an optimal level (Coursaris and Hassanein, 2002). If any of these players is underdeveloped (or absent), then the entire network may break down.

In summary, the unique characteristics of m-commerce discussed so far indicate several topics that need to be part of the curriculum for business management students who aspire to such job profiles as business analyst, marketing analyst, and systems analyst. To achieve a better understanding of these topics, a separate elective course is suggested to be offered that spans over at least 15 hours of pedagogy and discussions. The subsequent sections discuss the experiences of designing and conducting the m-commerce course at a highly respected Indian business management school as a part of the graduate program.

3. DESIGN AND DELIVERY OF M-COMMERCE COURSE

An elective course on m-commerce was offered to the graduate business management students at T. A. Pai Management Institute (TAPMI), an AACSB-accredited business school in India, in 2014. The course was scheduled in the fourth trimester after the students went through the core information technology (IT) course. This ensured that the students who subscribe to the course had a basic understanding of the technological and business concepts of IT. Being a new course, it had only 35 enrollees. Students who enrolled in this course had diverse work experience and aspired to work as business, systems, or process analysts in either consulting companies or the IT departments of large corporations.

3.1 Design of the Course Content

To ensure that the course contributed to the overall learning objectives of the business management program, the course needed to cover the basic technical aspects of m-commerce and the related managerial issues. Books that focused exclusively on m-commerce and could serve as a reference

Session	Lecture Topic	Pedagogy
Module 1: Basic Concepts of Mobile Commerce		
1	Introduction to m-commerce, drivers, and value chain	Lecture, discussion, and assignment
2	Mobile technologies: Communication, devices, Internet, operating systems, application software	Lecture, discussion, and assignment
3	Mobile application interfaces: Concepts of responsive interface design and adaptive interface design	Lecture, discussion, and assignment
Module 2: Mobile Commerce Services		
4	M-commerce services: Advertising	Case discussion: Top 10 mobile ad campaigns of 2013
5	M-commerce services: Analytics	Case discussion: TiVo
6	M-commerce services: Application	Case discussion: Mobile website vs. mobile app [Times of India, RedBus, OLX]
7	M-commerce services: Banking	Case discussion: M-Pesa in Kenya and India
8	M-commerce services: Content	Case discussion: GateGuru
9	M-commerce services: Multi-channel retail support and loyalty program	Case discussion: Apple Passbook
10	M-commerce services: Gaming	Case discussion: Candy Crush vs. Angry Birds comparative study
11	M-commerce services: Music	Case discussion: Spotify vs. iTunes vs. Pandora
12	M-commerce services: Location-based marketing	Case discussion: Foursquare
13	M-commerce services: Search	Case discussion: Jumptap and Picollator
14	M-commerce services: QR Code/ augmented reality/speech recognition	Case discussion: Blippar
Module 3: Legal Issues and Mobile strategy		
15	M-commerce: Legal issues	Case discussion: "Apple Settles Kids' In-App Purchases Lawsuit with FTC, Gives \$32.5 Million Refund for Customers"
16	Mobile strategy for businesses	Lecture and Simulation Assignment: Madura Garments (AVB Group)

Table 1. Course Syllabus and Session Plan

for the course included May (2001), Mennecke and Strader (2003), Sadeh (2002), Skeldon (2011), and Bandyopadhyay (2013). However, the authors faced three constraints in using these books as a reference. First, most of the books were published between 2000 and 2003. Given the rapid evolution of technology and business models in the m-commerce area, the content covered in the books, especially the exemplary case studies, would likely be obsolete in terms of the present-day context. Second, most books did not comprehensively cover the technological, business, and application aspects of m-commerce. Third, most of the books were not affordable. The books that were partly suitable for the course did not have Indian editions, and the prices of the original editions did not fit into the course budget.

In view of the constraints, the course outline was developed by compiling the content based on the distinct dimensions of m-commerce, for which the pertinent research was identified and discussed in the earlier section. Accordingly, the course was structured into three inter-related modules. The first module of the curriculum focuses on the drivers of m-commerce, the distinct use context, usability factors, the core components of the value chain, and the players who deliver m-commerce services. The second module concerned analysis of contemporary case studies from various m-commerce service segments, such as advertising, analytics, banking, gaming, and music, based on the elements presented in the first module. In all, a total of ten different case studies were discussed. The third module of the curriculum involved the legal issues associated with

m-commerce and the process of creating an implementation strategy of an m-commerce requirement for an organization, using a simulation technique. Overall, the course constituted 20 hours of pedagogy and discussions that spanned 16 sessions. The detailed session plan is presented in Table 1.

3.2 Details of the Sessions

3.2.1 Module 1: In the first session, students were introduced to the syllabus and related resources and assessments and were provided with an introduction to m-commerce and pervasive computing, basic differences between e-commerce and m-commerce; classification of m-commerce applications; implications of m-commerce services for activities on the space-time matrix; drivers and barriers of m-commerce, including convergence of mobile telecom network (e.g., transition from 2G to 4G standards) and the Internet technology standards (e.g., HTML, XML) that fueled m-commerce growth; and, finally, a brief discussion on value-chain components, players, and revenue models. The second lecture concerned technological aspects, such as mobile devices platforms and browsers, smartphones, wireless communication technologies (e.g., short-range to long-range connectivity; shift from 2G to 4G standards; wi-fi standards, such as IEEE 802.11 and IEEE 802.16; Bluetooth; RFID), content delivery protocols (i.e., SMS, MMS, WAP, USSD, GPRS, and Internet), and types of mobile software. The third lecture focused on applications' graphical user interface aspects, specifically on explicating nuances associated with adaptive interface design and responsive interface design of the mobile app, best practices and relevant considerations while designing a mobile app, and factors that need to be considered when making a decision on whether to build a mobile website or a native application or both.

3.2.2 Module 2: The second module spanned 11 sessions. Different types of m-commerce services, such as m-advertising, m-computing, m-banking, and m-content, were discussed in the sessions. These sessions typically comprised lectures of approximately 30 minutes, followed by a group presentation on an assigned case study related to the topic. Each group was expected to describe the case study details, classify the case in point based on the mobile app taxonomy proposed by Balasubramanian, Peterson, and Jarvenpaa (2002), and then present the analysis of the case study. The taxonomy proposed by Balasubramanian, Peterson, and Jarvenpaa classified mobile apps into eight categories based on three dimensions, namely the extent to which the application is sensitive to location of the user, the extent to which the application is time critical, and the extent to which the application is controlled by the user or the information provider. The analysis of the case study included a delineation of the critical technological features for the mobile app and related issues and the identification of appropriate business models and the associated value chain map linked with the business model and future trends. The presenting groups discussed the topic with the course instructor ahead of the session to ensure that the presentation augmented the learning presented in the lecture. This exercise served as a platform for the presenters and the

audience to share their professional and personal experiences with a particular mobile service. The instructor played the role of a facilitator for the discussions. The topics assigned to the groups are presented in the session plan in Table 1.

3.2.3 Module 3: The third module consisted of two sessions. The first session covered the security and privacy concerns that arise in the delivery of m-commerce services, such as restrictions and laws on driving, gambling, content monitoring, spamming, phishing, and rebirthing of mobile phones. The second session was dedicated to designing a mobile strategy for a case organization. The exercise consisted of several steps, including analysis of an organization's mission statement, identification of the scope for m-commerce services that contribute to the achievement of the mission, selection of the media channels and associated technologies to create awareness in target segments to have strong call to action, and evaluation of the criteria for selecting technology vendors associated with the delivery of the mobile service. The reference material that served the basis for the classroom discussions is presented in Table 2.

3.3 Assignments

The scheme of student learning assessment included group-wise case presentations, quizzes, a mid-term exam, and an end-term exam. The case presentations required a group of four to five students to analyze an m-commerce service based on a broad template and present the analysis to the class. The purpose of case presentations was to encourage students to gain technical and business-related knowledge of the emerging m-commerce services. The presentation required each group to introduce the mobile service, followed by a detailed case analysis, including evolution of the mobile service, analysis of cost and revenue models, value chain, associated technologies, comparison with its e-commerce counterparts and other similar service options, and future trends. Evaluation for this component was done on a 10-point scale based on the quality of the presentation, the corresponding case analysis report, and overall involvement of the group members in delivering their respective topic.

Quizzes were conducted at regular intervals during the course to encourage continuous learning and reinforcement of the concepts taught in the classroom. These quizzes also served as a feedback mechanism to the instructor and helped to identify gaps in the learning process of the participants as the course progressed. The mid-term and the end-term exams tested students' conceptual knowledge of m-commerce and application of the concepts in designing a mobile service. A potential business scenario for a mobile service was provided, and students were required to present the interface design of the mobile service and to discuss the feasibility aspects and a revenue model. For example, in the mid-term exam, students were asked to craft the mobile strategy for developing a "Football Tambola" game (also known as "Housie" and "Bingo") as a multi-player, fun game application for smartphone users and to launch it during an upcoming Indian football tournament, the "Indian Super League." Specifically, the students were asked to present the value-chain map for the proposed application, explain the

Session	Lecture Topic	Reference Material
1	Introduction to m-commerce, drivers, and value chain	Balasubramanian, Peterson, and Jarvenpaa (2002) Barnes (2002) Venkatesh, Ramesh, and Massey (2003)
2	Mobile technologies: Communication, devices, Internet, operating systems, application software	Tarasewich, Nickerson, and Warkentin (2001)
3	Mobile application interfaces: Concepts of responsive interface design and adaptive interface design	Mobithinking (2013)
4	M-commerce services: Advertising	Johnson (2013)
5	M-commerce services: Analytics	Google (n.d.)
6	M-commerce services: Application	Mobile websites and Mobile Apps of Times of India, Redbus and OLX
7	M-commerce services: Banking	Gilpin (2014) Saxena (2013)
8	M-commerce services: Content	Lunden (2013)
9	M-commerce services: Multi-channel retail support and loyalty program	Passbeemedia (2014)
10	M-commerce services: Gaming	France-Presse (2014)
11	M-commerce services: Music	Abbruzzese (2013)
12	M-commerce services: Location-based marketing	Buczowski (2013)
13	M-commerce services: Search	Schwartz (2013) Catone (2008)
14	M-commerce services: QR code/augmented reality/speech recognition	Angeles (2013)
15	M-commerce: Legal issues	FTC (2014)
16	Mobile strategy for businesses	Ontario (2013)

Table 2. Reference Material for the Sessions

role of each value-chain player, visualize and develop sequence wise wire-frames (screenshots) of the mobile app, and describe an appropriate revenue model.

3.4 Course Feedback

Students were asked for anonymous feedback at the end of the course, provided through a standardized course feedback form. The students rated the course on different parameters, including those related to course objectives, course execution, and the course instructor. Overall, student evaluations had an average course score of 7.60 (*SD* = 0.55)

on a 10-point scale. Specifically, the students perceived the course objectives as highly relevant (*M* = 7.05, *SD* = 0.07). Organization, structure, and delivery of the course had a mean score of 7.65 (*SD* = 0.60). Students perceived the course instructor’s knowledge and interest as highly resourceful (*M* = 8.06, *SD* = 0.10; Figure 1).

In addition to quantitative evaluations, qualitative feedback was sought from each student on the form’s informal comment boxes. Overall, the comments indicated satisfaction on the course content and learning approach. Comments included: “Good course with practical learning. Case presentations were stimulating. Enjoyed the discussions

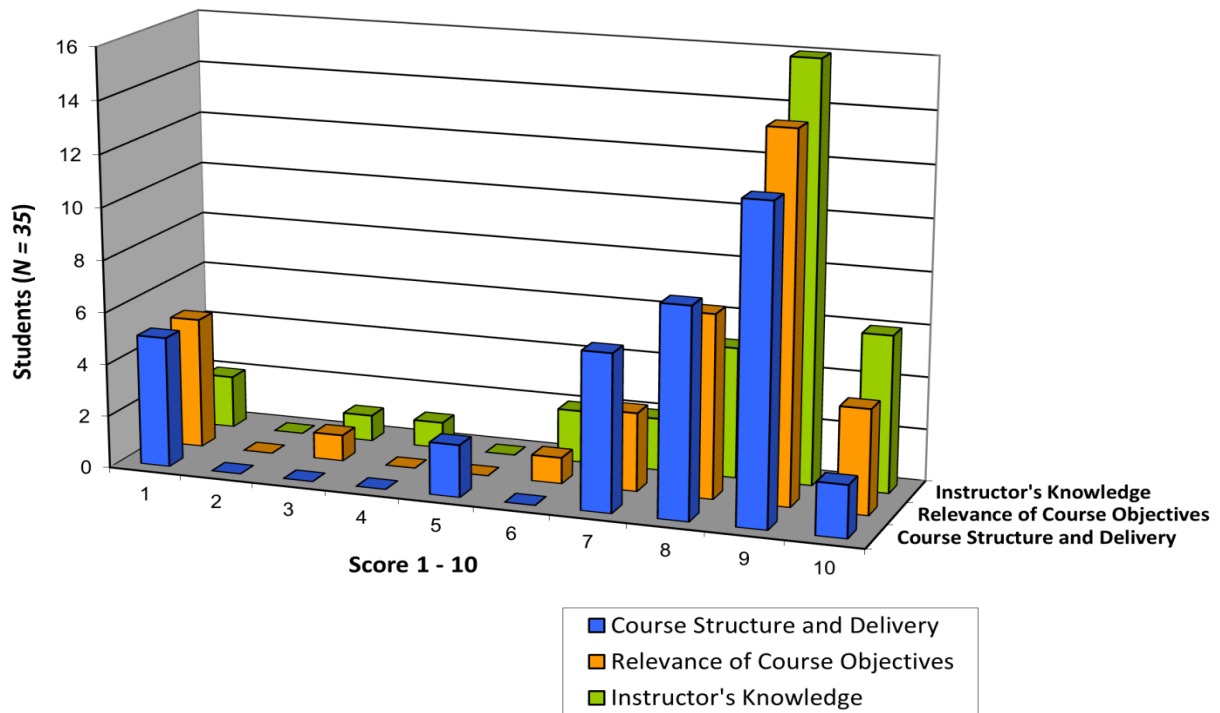


Figure 1. Student Feedback for M-Commerce Course

on live examples and the mobile app design (given in the exam)”; “Got awareness about the latest mobile trends like augmented reality. The case studies and class presentations were useful.”

Some comments, however, indicated the need to standardize the course by using a reference book that specifically addressed m-commerce topics relevant to business management education. Related comments were: “A textbook should be provided for reference purposes”; “A prescribed book, more reading material, should not rely on student’s presentations.”

Other feedback concerned the degree of focus on technical aspects of m-commerce. A few participants felt that course had greater focus on the technical aspects of m-commerce than the business aspects. For example, “Need to concentrate more on management side of cases rather than technical.” This feedback reiterates the challenge of designing technology-oriented courses for the business management students, who typically have diverse backgrounds such as engineering, chartered accountancy, and medicine.

4. CONCLUSION

M-commerce is being widely acknowledged as one of the technological trends that influences businesses, especially in developing countries, such as India, that have a large percentage of mobile users. These technological trends translate into a growing industry need to recruit business students who have knowledge of mobile technologies and

their relevant business aspects. Throughout this paper, the unique aspects of m-commerce as compared to its technological counterpart, e-commerce, were discussed and it was argued that m-commerce should be positioned as a separate course and not as an extension of e-commerce. The paper also provides guidance for designing a course that focuses on m-commerce, drawing upon the experience of the authors in designing and executing such a course for post-graduate business management students. Although the feedback of the course indicates a high level of satisfaction, it also presents a gap with regard to the reference book.

The course design and delivery inputs that are provided in this paper can serve as a beginning point for business schools that intend to offer a course on m-commerce. Further, academicians and industry experts should collaboratively address the need for a reference book on m-commerce designed for business management students.

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