Mobile Entertainment: Model Development and Cross Services Study

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Abstract— Mobile entertainment is a newly emerging sector. It is implicit throughout the study that proper classification of mobile entertainment services enables players in the value web to adopt appropriate business models to bring services to market and how they should cooperate, share revenue and jointly create competitive advantages. Nonetheless, a main difficulty when researching mobile entertainment is that of definition. It is recognized that, as mobile entertainment is a social and commercial process as well as a technical one, a diversity of other definitions for mobile entertainment is held by numerous industry producers and users, manufacturers and end consumers as well as researchers of dissimilar background. Mobile entertainment represents one of the few mobile services that have mass market potential that will drive the adoption of the next generations of mobile devices. The approach taken in this study is inclusive instead of restrictive; including a number of mobile services (such as mobile entertainment, mobile finance, mobile learning and mobile commerce as a whole) delivered through a mobile device, whether it is a mobile phone, a personal digital assistant or a handheld gaming device. This manner it is possible to deal with foreseeable convergence of the various mobile technologies. This paper presents a model to look at mobile services from multiple points of views concerning the service, network and device related sectors. It aims to classify mobile services into useful domains. This allows future research to be conducted with the clarity of distinguishing mobile services of different domains. The paper also attempts to gather and rationalize the possibilities and restrictions of existing and emerging mobile entertainment technologies with respect to this framework. The paper also explores a number of scenarios to reflect the understanding on the value web.

Keywords: classification; definition; framework; mobile services

I. INTRODUCTION

Electronic commerce describes the process of buying, selling, or exchanging products, services and information via computer networks, including the Internet [1]. Mobile commerce is an evolving area of electronic commerce, where users can interact with the service providers through a mobile and wireless network, using mobile devices for information retrieval and transaction processing [2]. Mobile commerce services and applications can be adopted through different wireless and mobile networks, with the aid of several mobile devices. It is a very promising and emerging industry, characterized by a continuously changing, complex and very

uncertain environment [3]. In particular, there are confusion at the levels of technology, demand and strategy.

Mobile commerce is forecast to be a significant growth market in leading countries. This high growth estimate of mobile phones is leading investors to take special interest in device manufacturing, provisioning and system management areas.

As of 2003, following the shocking collapses of several companies, announcements of massive depreciation for consolidated goodwill, misappropriation of funds and the difficulties encountered by operators trying to significantly reduce debt levels, upheavals in the world of telecommunications seems to have subsided [4].

Asia Pacific region confirmed its position as the main reservoir in the mobile market in the mid-term, through an increase in its total population of prepaid subscribers. According to IDATE [4], the region should have accounted for 38.7% of the global mobile subscriber base by the end of 2002 as shown in figure 1.
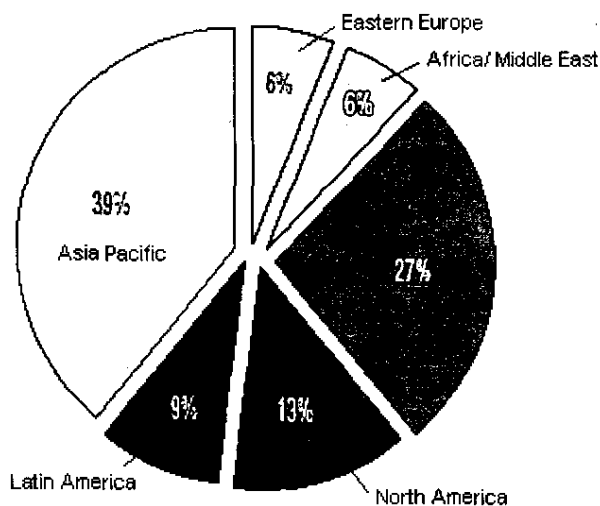

Fig. 1. Worldwide Mobile Subscribers by Percentage as of 2003 [4]

According to IDATE [4], Asia Pacific region, which should have accounted for 38.7% of the global mobile subscriber base by the end of 2002, again showed very steady growth (an increase of 32.3% in comparative terms and 106.3 million new subscribers in 2002, versus an increase of 40.9%

and 95.7 million new subscribers in 2001). Growth in the Asian mobile market was again higher than the worldwide average, but there are several disparities in this growth [4]. China's importance in the area grew considerably in 2002. In volume, China recorded 4.6 million additional new monthly subscribers, accounting for over a third (32.1%) of the increase worldwide [4]. The total number of Japanese mobile subscribers also continues to grow (an increase of 9.6%) in a country where the penetration rate, at almost 58% at the end of December 2002, is significantly lower than the weakest penetration rates in Europe [4].

Mobile entertainment represents one of the few mobile services that have mass market potential that will drive the adoption of the next generations of mobile devices [5]. Proper classification of mobile entertainment services enable players in the value web to adopt suitable business models to bring services to market and how they should cooperate, share revenue and jointly create competitive advantages. According to Datamonitor's The Future of Wireless Gaming report, four out of five European and United States mobile phone users will be playing games on their mobiles by 2005. Entertainment related usage accounts for 52.5% of overall usage in Japan as of 2002 [6]. The approach taken in this study is inclusive instead of restrictive, including all mobile services delivered through a mobile device, whether it is a mobile phone, a personal digital assistant or a handheld gaming device. This way it is then possible to take in hand the foreseeable convergence of the various mobile technologies.

II. PROBLEM BACKGROUND

Different approaches have been taken by researchers to classify mobile commerce services. Definitions of mobile entertainment found in various literatures are ambiguous. Hence, these definitions cannot be radically compared due to dissimilar grounds. According to Moore and Rutter [7], a primary difficulty when researching mobile entertainment is that of definition. It is not always apparent to consumers precisely what 'mobile entertainment' is. In addition, the problem of producing common understandings of mobile entertainment has been previously highlighted by the Mobile Entertainment Forum (MEF) when asserting that two different industries make up the mobile entertainment industry: entertainment and telecommunications [8]. Mobile entertainment is created as the convergence of both of these industries. Each of these worlds speaks a different language, and holds different assumptions about the nature of its work [8]. Recent research demonstrates that many consumers are unclear about the mobile entertainment and related wireless technology options available to them [7]. Andreou et al. [2] also assert that an important factor in designing mobile commerce services and applications is the need for identification of the mobile users' requirements, and the classification of the services along with their unique properties.

At the technological level, uncertainties are typically caused by rapid technological development and the battles for establishing standards, which are typical in the beginning stages of the life cycle of industry born thanks to a technological innovation [3]. Concerning demand, despite the generalized consensus about the huge potential of mobile business, there are many uncertainties about what services will be developed, whether the users are willing to pay for them and the level and time frame of their adoption [3].

Finally, strategic uncertainties are a common situation in emerging industries, whose essential characteristic from the viewpoint of formulating strategies is that there are no established rules of the game [9]. Therefore, a clear framework is require in order to permit players within the mobile entertainment value web to concentrate on the most critical part of their business and prevent them from repeating the costly mistakes of the recent past by entering, and subsequently exiting, non-core businesses and markets [10]. This study aims to classify mobile entertainment services to serve as a foundation for further research in developing appropriate business models for the value web.

Kalyanaraman [6] defines mobile entertainment as services which offer gaming experiences on-par with those to be had in other mediums such as Xbox and Playstation 2. On the contrary, it is of the authors' opinion that mobile entertainment services are more than merely games. Besides, the definition does not cover what constitutes mobile games. For example, if one were to consider games deployed on laptop and Gameboy as mobile game, similar development approach could not be taken to launch mobile games on mobile phones because generally, mobile games development on mobile devices should take into considerations of key characteristics such as short session time, fresh content, continuous and reliable availability, culturally compliant and so forth [6]. Furthermore, a game which is installed on a laptop can not be installed on a mobile phone due to dissimilar platforms.

In another literature, MGAIN [11] assumes mobile entertainment includes any leisure activity undertaken via a personal technology, which is, or has the potential to be, networked and facilitates transfer of data over geographic distance either on the move or at a variety of discrete locations. While workable, the definition does not cover whether mobile entertainment services must interact with service providers or telcos. It does not cover whether such service would incur a cost upon usage. If mobile entertainment were said to be a subset of mobile commerce, hence, it must involves transaction of an economic value. The social aspects of mobile entertainment are hidden within the phrase 'any leisure activity' [7].

A search on Google on the term 'Mobile Entertainment' reveals that even everything portable, including DVD player, television, radio, external player, MP3 player, amplifiers, speakers, as well as woofers and so forth are considered devices of mobile entertainment [12]. This proves that confusion with regards to the definition of mobile entertainment is common amongst stakeholders of the value web.

Mobile entertainment comprises of a range of activities including but not limited to downloading ring tone, logo, music and movie; playing games, instant messaging,

accessing location-based entertainment services, and Internet browsing [13]. Hitherto, the list is constantly expanding.

III. THEORETICAL FRAMEWORK

It is noteworthy to rethink and redefine mobile entertainment as it is more complex than other subsets of mobile commerce. A much greater barrier to mass market adoption of mobile entertainment is the question of revenue justification. The advent of mobile Internet has ushered in a good deal of confusion around the appropriate business models for the new data services. Mobile entertainment services are particularly vulnerable to this confusion. The authors examine multiple perspectives from various players of the value web as well as researchers of dissimilar background to bridge the gaps found in various definitions in order to reach a common understanding.

Mobile finance is an umbrella term for the process by which a customer may perform all forms of financial transactions and services on the move [14]. Examples of mobile finance include banking, brokerage, auction, bill payment services and so forth. Mobile learning is learning that is mediated via mobile technologies such as mobile phones, personal data assistants, handhelds, wearable devices or laptops [15]. Figure 2 shows the relationship of electronic learning and mobile learning.

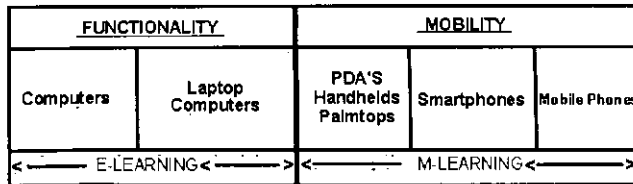| FUNCTIONALITY		MOBILITY		
Computers	Laptop Computers	PDA'S Handhelds Palmtops	Smartphones	Mobile Phones
< ——— E-LEARNING < ———>		< ———.——— M-LEARNING < ————>		

Fig. 2. Relationship of Mobile Learning and Electronic Learning [16]

The authors propose the following model as shown in figure 3 to classify a number of common electronic and mobile services. The two mediums which the framework sits on are wireless (Infrared, Bluetooth, GPRS etc.) and wired environments.

Commerce is the exchange or buying and selling of goods, commodities, property, or services especially on a large scale and involving transportation from place to place [17]. Mobile commerce is conducted over wireless environment whilst electronic commerce is conducted over computer-mediated wired telecommunication network. This model has been generalized from a specific model (mobile entertainment framework) in a prior research [12].
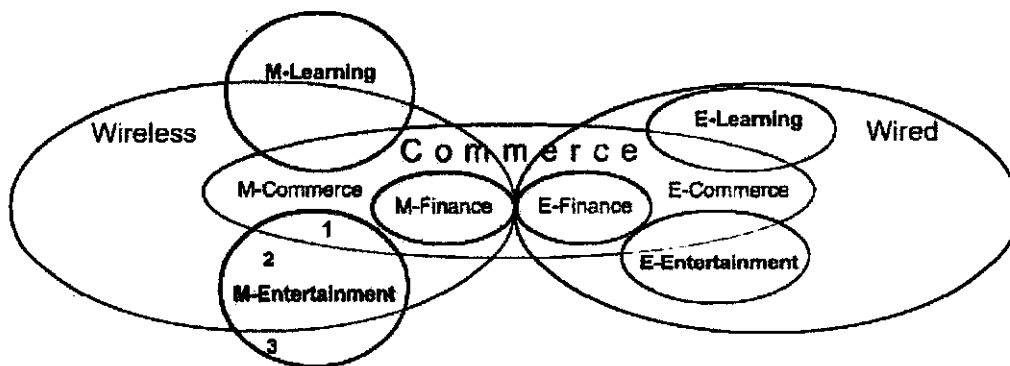

Fig. 3. Mobile Services Framework

Mobile learning and mobile entertainment is not restricted to wireless telecommunication networks as consumers may access learning material or enjoy leisure activity on the move due to the unique characteristics of ubiquitous mobile device. It is not necessary that both of these services must involve monetary value. Hence, the sections of mobile learning and mobile entertainment which intersect with mobile commerce are services which not only utilize wireless communication networks but also incur a cost upon usage. The sections of both of these services which sit on wireless environment are services which utilize the wireless telecommunication network yet do not incur a cost upon usage. For example, one may play mobile games (competing with a friend) via Bluetooth or share teaching material with a colleague via Infrared. Nonetheless, services which falls into the category of mobile learning or mobile entertainment which reside outside of the wireless environment are possible due to the

unique characteristic mobile devices have. For example, playing preinstalled Nokia *Snake* mobile game on mobile phone. This activity does not utilize wireless telecommunication network nor incur a recurring cost upon consumption. Attempts in answering downloaded past year's examination questions also fall into the section of mobile learning which resides outside of the wireless telecommunication environment.

On the other hand, both mobile finance and electronic finance must involve monetary value. Hence, they must reside within commerce entity. As for electronic learning and electronic entertainment, both of these services are restricted by wired telecommunication networks.

The authors briefly explain the different perspectives of mobile and electronic services and come up with the framework as shown in figure 3 which is believed to be useful in the development of end user models and consumer scenarios. Subsequently, players in the value web will be able

to use the framework in order to improve their understandings of the consumers and their usage scenarios. This will enable them to perform better evaluations of the likelihood of adoption, and will improve their foundation for designing, evaluating and timing end-user services [18].

IV. MOBILE ENTERTAINMENT: SCENARIOS

To put the framework into use, a few examples will be discussed in this section. In essence, taxonomy is a system of classifications. The previous section has clarified the scope of this research by defining the domain and its subset in figure 3. The purpose of this section is to present a classification of these segments to identify relevant categories of mobile entertainment services for this study.

A. Case 1: Watching Streaming Video on Mobile Device

A mobile user connects to the Internet via his WAP-enabled mobile phone, searches for a particular movie trailer and downloads it onto his mobile phone. This falls under Segment 1 (marked 1 in figure 3) where this activity utilizes wireless telecommunication networks, incurs a cost upon file download, interacts with service provider and is a form of leisure activity.

B. Case 2: Transferring Downloaded Video Clips to a Friend

In the same case, if the mobile user transfers the movie trailer to his friend's mobile device via Bluetooth or infrared, this falls under Segment 2 (marked 2 in figure 3) where such activity still utilizes the wireless telecommunication network yet does not incur a cost upon file transfer or involves any interaction with service providers.

C. Case 3: Recording Video Clip Using Mobile Device Equipped with Camera

On the other hand, if the mobile user records a video clip of him singing (provided if the particular mobile device supports video and audio recording) and plays it on his mobile phone, such an activity is still considered as mobile entertainment service but it does not utilize the wireless telecommunication network nor it incurs a cost upon usage. Therefore, this activity falls under Segment 3 (marked 3 in figure 3). The mobile user did not download the video clip nor did he transfer the file to another device.

Hence, in this scenario, the players in the value web vary in all three scenarios. The definitions of mobile entertainment for all three cases differ as well. Hence, the model in figure 3 aids the industries to determine appropriate business model to adopt in order to target the right audience. By classifying mobile entertainment service in its appropriate segment, it is then possible to determine the stakeholders involved, the network and device related requirements and business model required to develop and market the service. On top of these, the same concept can be extended to the areas of mobile learning, mobile finance and even mobile commerce as a whole.

V. CONCLUSION

It is only recently that industry has begun to broaden its views of the mobile consumers to include deeper understanding of users' behaviour. Predictions of increasing revenue from mobile entertainment services in the future depend ultimately on the successful development and the satisfaction of an end-user market rather than technical development.

From the framework, it is apparent that mobile services differ from electronic services due to the unique characteristics mobile services have (e.g. ubiquity). Hence, business models which have been proven successful to be used for deploying electronic services may not be entirely usable in the deployment of mobile services.

Mobile services and applications can be adopted through different wireless and mobile networks, with the support of various mobile devices. An important factor in designing mobile services and applications is the necessity for apt identification of consumers' requirements, as well as mobile devices and technologies constraints. Services and applications are designed and developed based on these requirements and limitations.

Mobile entertainment is a newly emerging and rapid developing sector. Within this area, playing games on mobile devices is considered one of the most popular activities, and already showing signs of rapid and lucrative growth.

This paper suggested a new framework in understanding mobile services and applications. This allows future research to be conducted with the clarity of distinguishing mobile entertainment services of different domains.

This paper serves as foundation for further studies to provide an extensive study on the drivers and the barriers that could be used to derive architecture for entertainment service provision to serve as a guide for telcos to outline suitable approaches in order to encourage mass market adoption of mobile entertainment services in Malaysia.

Corresponding research [19] of a survey of 384 respondents in Malaysia involves standard multiple regression analysis, which produces the basic pattern of likely causality. The authors also present some insightful observations of the association (without causal implications) between the factors affecting the adoption of mobile entertainment in Malaysia. In addition, the authors also discuss statistically significant differences between different groups of respondents with regards to their perception towards factors influencing the adoption of mobile entertainment in Malaysia [19].

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