

# Mobile Entertainment: Review and Redefine

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## Abstract

A primary 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, manufacturers and end consumers as well as researchers of different background. This paper presents a framework to examine mobile entertainment from multiple points of views concerning the service, network and device related sectors. This allows future research to be conducted with the clarity of distinguishing mobile entertainment services of different domains. The paper also tries to collate and rationalize possibilities and restrictions of existing and emerging mobile entertainment technologies with respect to this framework. The paper explores a number of scenarios to reflect the understanding on the value web. This paper serves as foundation for further studies concerning factors influencing adoption of mobile entertainment in Malaysia.

## 1. Introduction

Mobile commerce opens new evolutionary era in global business [1]. In mobile business there will be no need for international custom regulations that vary country by country, therefore it is business without borders [1]. A mobile commerce transaction is defined as any type of transaction of an economic value that is conducted through a mobile device that uses a wireless telecommunications network for communication with the electronic commerce infrastructure [2]. According to Andreou et al. [3], mobile commerce differs to some extent from electronic commerce due to the unique characteristics and limitations the mobile devices have.

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.

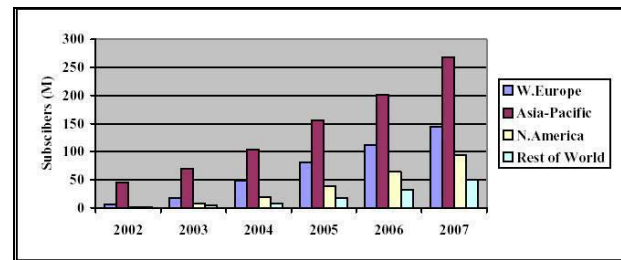


Figure 1. Worldwide Mobile Subscribers by Region [3]

The world is experiencing fast-growing mobile penetration rates. Prediction, based on both anecdotal and empirical, on the future popularity and volume of mobile commerce have been widely presented in academic literatures as well as business and technological press. Referring to Figure 1, it is predicted by BWCS [3] that the total number of mobile subscribers worldwide will increase to more than 1.72 billion by the end of 2007, compared to 950 in 2001, with Asia Pacific likely to retain its dominance pertaining to global market share. On top of that, Kangas [4] states that revenue in the Asia Pacific region is predicted to hit 39 billion Euros by 2010. However, a number of scholars and industry representatives have been much careful with such prediction. Berst [5] and Lewell [6] believe that many scholars and industry analysts have been overly optimistic with their prediction. Nevertheless, with such high concentration of mobile subscribers in the Asia Pacific region, it is important to understand the impact of large scale introduction of mobile entertainment into this region.

## 2. Contemporary Definitions of Mobile Entertainment

Mobile commerce services can be adopted through different wireless and mobile networks, with the aid of several mobile devices [7]. However, constraints of both mobile networks and devices influence their operational performance; hence, there is a strong need for taking into consideration those constraints in the design and development phases of mobile commerce services and applications. Another important factor in designing mobile commerce services and applications is the identification of mobile users' requirements [7]. Andreou et al. [7] 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 with their unique properties.

Definitions found in various literatures are vague. Hence, these definitions cannot be radically compared due to dissimilar grounds. According to Moore and Rutter [8], a primary difficulty when researching mobile entertainment is that of definition. It is not always apparent to consumers precisely what 'mobile entertainment' is. The problem of producing common understandings of mobile entertainment has been previously highlighted by the Mobile Entertainment Forum (MEF) when stating that two different industries make up the mobile entertainment industry: entertainment and telecommunications [9]. Mobile entertainment is created as the convergence of both industries. Each of these worlds speaks a different language, and holds different assumptions about the nature of its work [9]. Recent research demonstrates that many consumers are unclear about the mobile entertainment and related wireless technology options available to them [8]. For example, a Packard Bell sponsored survey of nearly 1000 British home personal computer users found that 70% of the respondents did not know what Wi-Fi was [10].

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 [11]. 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 [12]. The approach taken in this study is inclusive instead of

restrictive, including all entertainment delivered through a mobile device, whether it be a mobile phone, a personal digital assistant or a handheld gaming device. This way it is possible to address the foreseeable convergence of the various mobile technologies.

Travish and Smorodinsky [13] as well as Kalyanaraman [12] define 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 [12]. 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 [14] 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' [8].

A search on Google on the term 'Mobile Entertainment' reveals that even everything portable, including DVD player, television, external player, MP3 player, amplifiers, speakers, as well as woofers and so forth are considered devices of mobile entertainment.

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 [15]. The list is constantly expanding.

### 3. Redefining Mobile Entertainment

Different approaches have been taken by researchers to classify mobile commerce services. According to Andreou et al. [7], one technique to classify mobile commerce services and applications is based on the functionality they offer to the mobile users. This kind of classification results in two major classes: the directory and the transaction-oriented services and applications [7]. The major categorization between these two classes of services is that in the former a mobile user performs only read requests to the directory, whereas in the latter a user performs read and write requests to the transaction server. It is necessary to note that a mobile commerce application can be a combination of both classes [7].

Andreou et al. [7] assert that the directory-oriented class of mobile commerce services comprises applications that provide information to mobile users. This information can be location, content and user dependent, being localized and personalized in ways appropriate to the specific mobile user. For example, a mobile user, being away from home, needs up-to-date

information regarding his current location, and local facilities that he can use. The transaction-oriented class comprises various services and applications with which the mobile user conducts transactions with the service provider [7]. The transactions contain read and write operations on behalf of the mobile user [7]. For example, a banking service for mobile users falls into the transaction-oriented class of mobile commerce services.

One white paper defines mobile commerce from a technological point of view. Mobilocity Inc. [16] asserts that wireless Internet is beset with a multitude of competing standards as shown in Figure 2.

The wired computing environment is largely homogenous, comprising a relatively limited set of mature and interoperable operating systems. In contrast, there are a plethora of operating systems and microbrowsers used to run Web-based applications on mobile devices [16]. Similarly, different bearer networks caused the problem of subscribers not being able to use their mobile devices outside their coverage area, and developers are potentially forced to create multiple versions of the same applications [16].

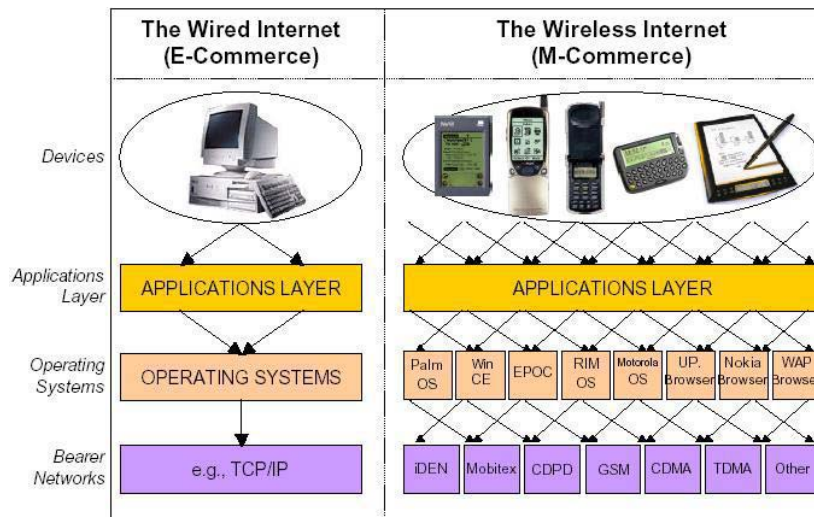


Figure 2. The Wired versus Wireless Technology Landscape [16]

From a business perspective, various literatures attempt to classify mobile entertainment value web by referring to its players within the industry. For example, Wiener [9] asserts that to help all participants in this industry collaborate, clarification of how each industry defines the nature of its work is necessary. The goal is to offer a set of common definitions of typical industry players and various mobile entertainment roles for the interfaces between the businesses [9]. In another paper, Camponova [17] classifies the players in the value web based on

technology, services, network, regulation and user. A summary of the findings is concluded in Table 1.

Table 1. Terminology of Mobile Entertainment [9]

Terminology	Definition
Platform vendor	Develops, implements, manufactures, supplies, and supports standard or customised platforms to the platform operator.
Service provider	Brings content to the end user,

	undertake the commercial and regulatory obligations that accompany the provision of service; does not involve the operator of the service.
Mobile network operator	Provides the infrastructure for mobile communications, the service, billing and customer care.
Publisher	Refers to any company or individual that allows for the “publishing” of a piece of content; typically assumes the financial risk for the creation of the content; maintains control of all aspects of the entertainment service including rights management and payment, user-service interaction, multi-user interaction, and user-per-service preferences.
Retailer	Delivers services to end users. In the mobile industry the retailers are either specialised for mobile services or mass retailers. Entertainment retailers are usually mass retailers.
Developer	Performs application development.
Subscriber	Refers to the end user or consumer of mobile entertainment services.

The authors examine multiple perspectives from various players of the value web as well as researchers to bridge the gaps found in various definitions in order to reach a common understanding. The authors consider the following as key considerations in determining whether a mobile service falls under mobile entertainment category: a form of leisure activity, interaction with service providers, utilization of wireless telecommunication networks, and transaction which incur a cost upon usage. To understand mobile entertainment, three different segments are suggested in Figure 3. Each segment suggests a specific set of theories. It is implicit throughout this study that mobile entertainment is any

type of leisure activity on the move. Segment 1 consists of intersection between mobile commerce and mobile entertainment, sitting on top of wireless telecommunication networks. In other words, mobile entertainment services in segment 1 must be subset of mobile commerce, which involves exchanges of monetary value and interaction with service providers. Segment 2 covers mobile entertainment services which utilize wireless telecommunication networks, but do not incur a cost upon usage and do not interact with service providers. For example, one may play multiplayer mobile games with friends via Bluetooth. Segment 3 involves mobile entertainment which does not require wireless connection and transaction of an economic value. For example, one may play preinstalled single player games on mobile phone.

The authors briefly explain the three different perspectives and come up with a model which is believed to be useful in the development of end user models and consumer scenarios. Subsequently, players in the mobile entertainment value web may improve their understandings of the consumers and their usage scenarios. This will make them perform better evaluations of the likelihood of adoption, and will improve their foundation for designing, evaluating and timing mobile entertainment end-user services [18].

#### 4. Mobile Entertainment: Scenarios

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.

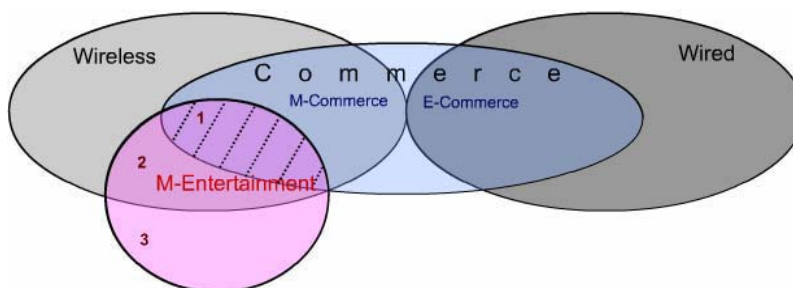


Figure 3. Mobile Entertainment Model: Position in the Value Web

#### 4.1. Case 1: Downloading ring tone onto mobile devices

A mobile user connects to the Internet via his WAP-enabled mobile phone, searches for a particular ring tone and downloads it onto his mobile phone. This falls under Segment 1 where this activity utilizes wireless telecommunication networks, incurs a cost upon file download, interacts with service provider and is a form of leisure activity. If he transfers the ring tone to his friend via Bluetooth or infrared, this falls under Segment 2 where such activity still utilizes the wireless network yet does not incur a cost upon file transfer or involves any interaction with service providers. However, if he composes a ring tone (provided if the mobile device supports ring tone composing) and sets it as default ring tone, such activity is still considered as mobile entertainment but it does not utilize the wireless network nor it incurs a cost upon usage. Therefore, this activity falls under Segment 3.

Hence, in this scenario, the players in the value web differ in all three scenarios. The definitions for all three cases vary 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.

#### 4.2. Case 2: Playing games on mobile devices

A mobile user connects to the Internet via his WAP-enabled mobile phone, searches for a particular java game and downloads it onto his mobile phone. This activity falls under Segment 1. Assuming that the downloaded game can be played as either a single player or multiplayer game, if the mobile user competes against his friend via Bluetooth, this activity falls under Segment 2. In the third scenario, a mobile user plays preinstalled games on mobile phone. He did not download the game nor did he transfer the game from another device. Nonetheless, the third scenario falls under Segment 3.

As a result, the model in Figure 3 is proven useful in classifying mobile entertainment services. By categorizing mobile entertainment service in a particular 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. A table of comparisons of mobile entertainment services is shown in Table 2.

**Table 2. Overview of Applications Segmentation for Mobile Entertainment**

Segment 1	Segment 2	Segment 3
Watch a streaming	Share downloaded video clip with	Record video clip on mobile

video on mobile device	friends via Bluetooth	devices equipped with camera
Send MMS to a friend's mobile device	Transfer pictures to a friend's mobile device via infrared	Snap pictures with mobile devices equipped with camera
Download music onto mobile device	Transfer music file to a friend's mobile device via infrared	Listen to music files transferred from PC to Apple iPod

According to MGAIN [11], mobile entertainment does not exclude 'portfolio technologies' such as Apple's iPod or Palm's Zire which are not wireless but rely on being networked to other devices between periods of mobility. However, in the authors' opinion, such service falls under Segment 3. Besides, such activity does not incur a cost and does not interact with service providers.

### 5. Conclusion

Mobile entertainment 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 entertainment 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.

This paper suggested a novel framework in understanding mobile entertainment services and applications. The proposed approach relies on consumers' needs, the classification of mobile entertainment services and applications, as well as the current technologies for mobile and wireless computing and their constraints. This allows future research to be conducted with the clarity of distinguishing mobile entertainment services of different domains.

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. Therefore, it is in no doubt that attention needs to be given to mobile entertainment services which fall in Segment 1 – a segment which contributes as the main source of data revenue for telcos. This paper serves as foundation for a corresponding research [19] to provide an extensive study on drivers and barriers that could be used to derive architecture for entertainment service

provision to serve as a guide for telcos to outline suitable approaches to encourage mass market adoption of mobile entertainment services in Malaysia.

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