

Definitions, Key Characteristics, and Generations of Mobile Games

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INTRODUCTION

In the emerging wireless environment of digital media communications represented as *ubiquitous* and *convergence*, rapid distribution of handheld mobile devices has brought the explosive growth of the mobile content market. Along with the development of the mobile content industry, mobile games supported by mobile features such as portability (mobility), accessibility (generality), and convenience (simplicity) have shown the highest growth rate in the world game market these days.

In-Stat/MDR (2004) and Ovum (2004) expect that the mobile games' annual growth rate between 2005 and 2009 will be around 50% in the United States and 30% in the world. According to KGDI (2005) and CESA (2005), compared to the rate of the whole game market (5%) of the world, it is about six times higher, and it exceeds the rate of video console (10%) and online games (25%). Mobile games thus are predicted to be one of the leading platforms in the world game market in 10 years' time. In addition, as the competition among game companies has been enhanced with the convergence of game platforms, mobile games are being regarded as a breakthrough for the presently stagnant game market, which has focused on heavy users.

However, due to the relative novelty of mobile games, there are a few visible barriers in the mobile game industry. First, definitions and terminologies and key characteristics related to mobile games are not clearly arranged as yet. Second, there is little research on the classification and development trends of mobile games. Therefore, this article is designed to contribute insights into these barriers in three ways. Firstly, the article provides narrow and broad definitions of mobile games. Secondly, key characteristics, platforms, and service types of mobile games are discussed. Finally, following the broad definition of mobile games, this article classifies mobile games as one to fourth generations and one pre-generation. Characteristics and examples of each generation are also presented.

DEFINITIONS OF MOBILE GAMES

Each country and each game research institution has different definitions and terminologies. The definition of mobile games is important because the functions of mobile devices are being converged with those of other devices. Mobile games—more precisely, mobile network games—are narrowly defined as *games conducted in handheld devices with network functionality*. The two key elements of this definition are *portability* and *networkability*. In this definition, mobile games are generally referred to as the games played in handheld mobile devices such as cell phones and PDAs with wireless communication functionality. In terms of portability and networkability, the characteristics of mobile games are different from other device platforms such as PC and console games, which do not have both portability and wireless capability. For example, Game Boy (GB) with no communication functionality was only regarded as a portable console device. However, this concept has lost some of its ground in the market since the advent of new mobile game devices from portable consoles such as PlayStation Portable (PSP) and Nintendo Dual Screens (NDS), as wireless networked games began to be serviced through the new mobile game devices.

Mobile games can be broadly defined as *embedded, downloaded, or networked games conducted in handheld devices such as mobile phones, portable consoles, and PDAs*. The key element of this concept is portability: all games in portable devices can be thought of as mobile games without regard to wireless functions. Therefore, this concept expands mobile games by including video games in portable consoles and embedded games in general portable devices such as PDAs, calculators, and dictionaries. As most game devices have been adopted with wireless networking functions, this definition becomes more powerful in game markets.

Recently, the narrow definition of mobile games has been generally used. However, since the meaning of *mobile* includes that of *portable and network (either wired or wireless function is embedded)*, the broad definition of mobile

games including portable game-dedicated devices such as GBs and PSPs should be used. This definition is more persuasive in the present and future game market. For instance, the competition between Nokia's N-gage (i.e., a cell phone integrating the functions of MP3 and games) and Sony's PSP (i.e., a portable game machine including functions of MP3 and networking) is for the preoccupation of a future mobile platform.

KEY CHARACTERISTICS, PLATFORMS, AND SERVICE TYPES

Characteristics and Limitations of Mobile Games

Mobile games are differentiated from other platform games such as console, PC, and arcade games in terms of their portability, accessibility, networkability, and simplicity. Owning to the *portability* (i.e., mobility), users can play games anytime. This characteristic has attracted many light users, who play simple games such as puzzle, card, or word games, because these games can be played in one's spare time in a short amount of time. Compared to players in other genres such as role playing games (RPGs) and simulation games that require a long time to play, light users vary broadly in terms of age, and many women players also belong to this group. This is one of the strongest potentials of mobile games. The second characteristic of mobile games is *accessibility*. This can be defined as to the extent one can use a mobile device to play games at anytime and at anyplace. Console games are restricted to owners who have console machines and who want to enjoy games for a long time in a particular place. Likewise, most PC games and arcade games need to be somewhere in front of game devices with network facilities. However, mobile games—especially using mobile devices—are easy to access, because people almost always bring those devices anywhere and can download games anywhere as long as wireless networks are available. The third characteristic is *networkability*. Through wired or wireless connections, online games and console games are transplanted into mobile games to facilitate game usages. For example, some online games are linked to mobile games, so those games can be used both in PCs and mobile devices: game users can play the games with no limits in terms of location, machine, and time. Furthermore, mobile game users can play multi-user real-time games such as MMORPG (massively multiplayer online role-playing game) and real-time strategy (RTS) games. The final characteristic is their *simplicity* to use: mobile devices are simpler to handle than other platform machines. In addition, it is much easier to acquire the skills of the games and use them than those of other platforms.

Because of these characteristics, mobile games develop faster than other platform games. According to W2F (2003) and KGDI (2005), the development of a PC or console game usually takes at least two years to develop with more than 20 trained people and about \$3 million. But in mobile games, about three to six months are spent with five people and less than \$150,000. This is why the initial market entry barrier of mobile games is lower than that of other platform game markets. However, the average lifecycle of mobile games is less than six months, and value chains are more complex than those of other platform games.

Despite the major advantages of mobile games, there are drawbacks in some points. The most essential point is from not-unified platforms. With Internet and console games, converting of original games is not necessary, because the original games can be available in any PC via the Internet. However, mobile games should be converted to make them fit to other platforms, even in the same area. In other words, the conversion is necessary for service to be available in other mobile devices. The second is small screens and low capable devices. Although 3D networked games are being serviced, small screens and monotonous sounds are not sufficient to maximize the feelings of presence for users, and mobile game devices still do not have enough capacity to download high-capacity games through mobile networks.

Mobile Game Platforms

Mobile platforms function as game engines by running applications: a game engine is the core code handling the basic functionality of a game. Each mobile device has its own platform, so developers make games based on the formats of those platforms. With the development of platforms, downloaded, 3D games, and more advanced games are now serviced. These platforms are either freely opened or purchased with license fees. Platform holders have tried to expand their platforms, because the prevalence of their platforms implies a strong influence in mobile markets. These days, Java is the most influential platform both in mobile phone games and in handset manufacture. The Java 2 Micro Edition (J2ME) is a freeware version of Java; Execution Engine (ExEn) and Mophun are also freeware platforms distributed mainly in Europe. Brew is the licensed platform mainly used in the United States, Japan, and Korea. Different from mobile phone games, portable console games such as GB, N-Gage, PSP, and NDS have their own development tools for the platforms. Developers who want to make mobile games in portable consoles should use such development kits with the charge of license fees. Since developers adopt more prevailing game kits for the better benefit of their games, the market prevalence of console platforms is parallel with the amount of license fees for portable console manufacturers.

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