Taxonomies, Applications, and Trends of Mobile Games

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INTRODUCTION

Wireless communications and the distribution of cell phones have been rapidly extended with the expansion of mobile content services since the early 2000s. With such extension, mobile games have been viewed as a separate branch in game device platforms. While studies on mobile contents have increased for several years, research on mobile games is still in the early stages. Although mobile games have developed and expanded their ranges in game markets, there is little research on the classification and development trend of mobile games. Considering that game devices have been converged into ubiquitous communication/networking features and the range of games has been expanded from entertainment to education, health, and exercise, there is an urgent need to study mobile games' taxonomy, application, and future trends.

In this article, mobile games are classified by several criteria (i.e., contents, platforms, and multi-layer based). Examples of mobile games are summarized, along with taxonomies. Lastly, applications and the macro trend of mobile games will be presented. In addition, some insights in the design and development of mobile games will be discussed.

MOBILE GAME TAXONOMIES

Games are different from other genres such as music, film, and literature in the participation of users. *Interactivity* and *narratives* are two important factors to categorize games. Aarseth, Smedtad, and Sunnana (2003) classified games with a number of basic dimensions such as space, perspective, time, and teleology. Klabbers (2003) suggested social systems such as actors, rules, and resources for the establishment of game taxonomy. Wolf (2005) considered some standards such as the games' goals and objectives, and the nature of the games' play-characters and control devices. The devices have been applicable to traditional games in PC or console games with wide monitors, gorgeous graphic environments, and broad structures of narratives. Nowadays, however, with the development of fusion games and the acceleration of genre convergence, the clear division of game genres has been difficult because many cross-listed games emerged in two or more genres (Wolf, 2005). Considering such a trend and characteristics of mobile games, this article classifies mobile games into some basic genres.

First, content-based taxonomy is conducted from the basic features of games such as the control range of gamers, the role of characters, and the degree of user participation. Second, platform-based is from mobile device platforms with which games are played. Third, multi-layer-based is from the capability of multi-player network and 3D graphic technology.

Content-Based Taxonomy

The role of gamers is the essential element in game taxonomy. Gamers can take their own individual roles or become omnipresent beings in games. Role-playing games (RPGs) comprise the representative genre of individual role games; strategic simulation games are controlled by omnipresent gamers. These games can be divided by the environments of the role of gamers: gamers should be a shooting gunner in shooting games; gamers should be an adventurer in an unknown world in adventure games. In these games, users usually take on their own roles. Finally, such games could be classified by the degree of user participation: multi-player games are played by the collaboration of individual roles; team games are played by teams (or guilds) with enough members having individual roles.

- **Role Playing Games:** A gamer as a character takes on an individual role in accomplishing missions or quests. The user can upgrade his/her character and take items to complete missions effectively.
- **Simulation Games:** Users complete their missions in simulated environments by controlling resources such as objects, characters, and items with their own strategies. There are some types of simulation games such as construction, management, or war simulation games.
- **Fighting Games:** Gamers take a character and fight with skills of kicking or striking against other char-

acters to win the contests. There are some kinds of fighting games mixed with action marshals such as judo and boxing; they are sometimes referred to as action fighting games.

- **Shooting Games:** Users take on their missions as a shooter or artilleryman in a war or as an infiltrating agent in an operation. In these games, the perspective of a user is a very essential element in attracting the user's involvement. Therefore, shooting games with the first-person perspective are usually referred to independently as first-person shooting games (FPSs).
- **Adventure Games:** Users take travels to unknown space or environment as travelers or warriors.
- **Sports Games:** Users take on a role or control teams in sports contests such as baseball, basketball, or football. Racing sports such as riding and car racing are usually called racing games.
- **Board Games:** Users compete with opponents in traditional board games such as chess, Tetris, puzzles, oriental chess, baduk, and so forth.
- **Single-User Games:** Only one user can participate with a role or mission.
- **Team (or Guild) Games:** Users should join a team with other users to complete missions or win a contest.
- **Massively Multi-Player Online Games (MMOGs):** A huge number of users can participate simultaneously with their roles or missions.

Platform-Based Taxonomy

Mobile devices are also regarded as independent platforms. Each mobile device has its own features in containing mobile games. Thus, if producers want to transplant a game in a device into another one, they should restart the product processes from the beginning. For this reason, platform-based taxonomy is beneficially used in mobile games. In terms of mobile devices, mobile games are classified into mobile phone, portable console, and PDA games. In terms of mobile platforms, mobile games are called Java games, Brew games, and WAP games.

- **Mobile Phone Games:** Conducted in cell phones.
- **Portable Console Games:** Played in portable consoles; examples include PSP (Play Station Portable), NDS (Nintendo Dual Screen), and GBA (Game Boy Advance).
- **PDA Games:** Embedded or downloaded in PDAs.

Multi-Layer-Based Taxonomy

Multi-layer-based games are classified with the adaptation of high technology including capability of multi-player network and 3D graphic technology. Mobile games have developed from text-based to 3D multi-user network games. Therefore, in terms of multi-layer-based taxonomy, mobile games can be classified into five types: text-based, 2D graphic, 2D network, 3D half network, and 3D multi-user network games. Table 1 summarizes the taxonomies of mobile games with genre examples by the criteria of division.

MOBILE GAME APPLICATIONS AND INDUSTRY

Application Areas of Mobile Games

The application areas of mobile games can be categorized into four areas: traditional game industry, mobile Internet applications, mobile advertisements, and new applicable areas.

The most applicable area of mobile games concerns the traditional game industry. With the development of handheld

Table 1. Taxonomies of mobile games

	Criteria of Division	Genre Examples	Examples
Content-Based	Control range of gamers	RPGs Simulations	*Doom RPG* *Real Estate Tycoon*
	Role of characters	Fighting (Action) Shooting, Sports Adventure, Board	*Mortal Kombat* *Quake Mobile, FIFA06* *Tomb Raider, Tetris*
	Degree of user participation	Single-user, Team, Multi-user	*Deep Pocket Chess* *Samgukji, Undercover2*
Platform-Based	Device platforms	Cell phones, PDAs, Portable consoles, etc.	
	Game platforms	WAP, Java, Brew, etc.	
Multi-Layer-Based	Adaptation of 3D graphic and network technology	Text-based, 2D graphic, 2D network, 3D half network (3D games with two or several users) 3D multi-user network (3D MMOGs, etc.)	