MOBILE GAMES: WHAT TO EXPECT IN THE NEAR FUTURE

Marco Furini
Computer Science Department - University of Piemonte Orientale
Via Bellini 25/G - 15100 Alessandria, Italy
Email: furini@mfn.unipmn.it

KEYWORDS
Mobile Gaming, Mobile Development Platforms.

ABSTRACT
The current mobile gaming market is filled with the so-called casual games. Simple and easy, these games are well suited for devices with limited resources and for people who play games now and then. This is why Tetris and Pac-man are among the best sellers games of several mobile games charts. In this paper we analyze current developing platforms, networking technologies, delivery models and game characteristics of the current mobile gaming scenario, in order to identify directions that will lead to the near future of the mobile gaming scenario.

THE MOBILE GAMING MARKET
The success and the popularity of mobile games are making the mobile gaming a successful market. Expectations are high as reported by different research reports, which forecast the mobile gaming market between 10 and 20 US$ billions by 2011 (see, Gibson (2006)). Nowadays the mobile gaming scenario is filled with a wide range of games (from very simple graphic games to cutting edge 3D graphics; from single to multi players games) (see, Figure 1). However, looking at today’s mobile gaming market sales, it is interesting to note that customers prefer the so-called casual games, easy and simple to play. Just see the best sellers mobile game charts of different cellphone network operators, to note that most of the titles are simple and easy to play: Tetris, Pac-Man, Pong, Frogger, just to name a few. The success of casual games has various reasons: i) mobile games are basically used by normal people, the so-called casual gamers, to kill time or to mitigate boredom and are not meant to replace powerful gaming console, ii) limited screen size and input keyboard are a burden for complex games, whereas they are sufficient for casual games, iii) old titles, usually simple and easy to play, are familiar to a large segment of current mobile device’s owners and familiarity is an important factor in a game purchase decision (see, Telephia (2007)), iv) the computational power of current cellphones is limited with respect to gaming console, but is comparable to the one of old gaming console, and hence sufficient to support simple games.

Will casual games play a fundamental role in the future of the mobile gaming market? Will casual gamers be principal target of the game industry? Will hardcore gamers be more considered in the future mobile gaming scenario? In this paper we analyze the current mobile gaming scenario in order to identify directions that will lead to the near future of the mobile gaming scenario. In doing this, we focus on developing platforms, networking and graphics technologies, delivery models and games characteristics. Based on the highlighted directions, the future mobile gaming scenario is likely to be no longer focused on casual gamers, but hardcore gamers will be the main target; casual games and complex games will coexist and mobile games will massively use features like multi-player capabilities, social aspects, location and proximity information and high quality graphics. Figure 2 summarizes a possible evolution of the mobile gaming scenario.

DEVELOPING PLATFORMS
Today, the mobile scenario suffers from a considerable platform fragmentation problem (see, Koivisto (2006)), which is a real burden for the popularity of mobile applications and of mobile gaming in particular. In addition, since the number of different mobile devices is enormous, game developers are practically unable to release a game version for any different platform and for any different mobile device. Needless to say, making a game available to the entire mobile market is almost impossible, as the inter-platforms porting cost may be higher than the developing cost of the entire game. Currently, Java ME, Brew, Symbian and Flash Lite are the most popular software platforms used to develop mobile games.

Java Micro Edition (Java ME) is a collection of technologies and specifications to develop software for devices with limited resources and is currently the most ubiquitous application platform for mobile device. The main advantage of using Java ME is that an application can be written once and can be used on every device Java ME compatible. However, the only way to guarantee that the developed application will run on a particular device is to test it on that particular device. Needless to say, this is a limitation. Furthermore, Java ME applications run slowly compared to applications specifically
Figure 1: Mobile games evolution: from snake to NBA Live.

<table>
<thead>
<tr>
<th>Mobile Games</th>
<th>Today</th>
<th>Tomorrow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Casual games</td>
<td>Casual games - Multiplayer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>social - location - proximity</td>
</tr>
<tr>
<td>Networking</td>
<td>2G, 3G</td>
<td>Wi-Fi, Bluetooth, 3G, location</td>
</tr>
<tr>
<td>technologies</td>
<td>bluetooth</td>
<td>technologies</td>
</tr>
<tr>
<td>Multimedia</td>
<td>2D graphics</td>
<td>3D graphics</td>
</tr>
<tr>
<td>features</td>
<td></td>
<td>Audio Surround</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Voice communications</td>
</tr>
</tbody>
</table>

Figure 2: The evolution of the mobile gaming scenario.

designed for a particular device/platform and this may be a problem for games that need a fast system response. **Symbian** is a proprietary operating system designed for mobile devices with limited resources. Symbian applications, usually written in C++, are designed for a particular device and hence they are more reliable and faster than applications written for generic devices. Needless to say, they are more complicated to write.

**Brew** (Binary Runtime Environment for Wireless) is a development platform created to run between the application and the wireless device’s chip operating system; therefore BREW allows programmers to develop applications without bothering themselves with system interface or networking details. However, to develop a BREW application it is necessary to submit the application for testing, and this introduces a significant additional cost (both in terms of time and money).

**Flash Lite** is a lightweight version of Adobe Flash Player optimized for mobile phones and consumer electronics devices. This approach is ideal for applications that massively use audio/graphics features and is becoming very popular as it has been adopted by several cellphones operators, but currently, the main drawback is that applications are not capable of communicating with technologies like Bluetooth and infrared.

Far from identifying the best platform, we simply note that, from the mobile gaming market point of view, a unique platform would be necessary. However, it is unlikely that the platform fragmentation problem will find a solution. What is very likely to happen are porting solution to automatically move from one platform to another. A first step toward porting solutions is **alcheMo**, an automated Java ME-to-BREW porting solution developed by Innaworks.

**TECNOLOGIES**

Currently, mobile devices are more and more similar to hand-held computers, with increasing processing power, considerable storage space and interesting multimedia features. However, to transform a mobile device into a mobile gaming console, graphics features and networking technologies need to be improved.

In the near future, free-of-charge networking technologies like Wi-Fi and Bluetooth will be available also in entry-level mobile devices, causing the network latencies to decrease (a latency below 150 ms is mandatory to support interactions). In such a scenario, gaming applications should automatically choose the most appropriate communication technology in a transparent way from the user point of view.

Location technologies will play an important role in gaming applications and hence technologies like GPS and RFID are likely to be available in entry-level mobile devices.

3D Graphics should be supported: A first step toward this direction is the OpenGL ES (OpenGL for Embedded Systems) project, which is a subset of the OpenGL 3D graphics API designed for embedded devices such as mobile phones, PDAs, and video game consoles (see, Group (2007)). Also the Java community is working to provide 3D graphics in mobile devices with the Mobile 3D Graphics API (M3G for short).

Multimedia technologies should better support interactions among users (the usage of the small keyboard is a real burden). A step toward this direction has been done by **Pathway to Glory** a world war II game that makes use of voice communication to allow gamers to send voice messages to each other during the game. VoIP is a mature technology than can be embedded in mobile games.

**DELIVERY MODELS**

Currently, cellphone operators are offering customers an easy way of downloading mobile games (in US, on-portal mobile game revenues account for 74 percent of total mobile game revenues Telephia (2007)), but the main burden in downloading mobile applications is the cost of the data traffic.

In the future, with more complex mobile games, this downloading cost will be a major problem and hence this delivery model is likely to be coupled with bricks-and-mortar retailers, where mobile games can be sold on different supports like multimedia memory cards. This different delivery model will account for 9.1 percent of the total global revenues for mobile games by 20101.

---

1http://www3gcouk/PR/May2005/1459htm
MOBILE GAMES

Today, with an average play out of 11 minutes (see, Telephia (2007)), the most successful games are the so-called casual games (a.k.a. snack games), while the popularity of multi-player games is still quite limited.

Casual games are very simple to play since they are based on very simple rules, basic techniques, simple strategies and do not require special skills. These games are played in short bursts, during work breaks or, in the case of portable and cell phone games, on public transportation. Due to their simple characteristics they can be played on the majority of current cell phones and hence they are immediately available to casual consumer; people who cannot be defined as typical gamers, instead, they play games when they come across them. Tetris, one of the best sellers game in the mobile gaming scenario, is an example of casual game.

Multi-player games allow thousands (or even more) players to play at the same time, but currently, the mobile versions of these games are not very popular. As previously mentioned, the network latency is the main burden for the popularity of these games, as well as the fact that the data mobile traffic is quite expensive. By 2010, online multiplayer games will generate 20.5 percent of total global revenues.

As recently happened, mobile games will be developed exploiting the characteristics of the mobile device: they will use advanced graphics and advanced communication technologies, but also social aspects will play an important role in the development of mobile games.

Due to the success of Web 2.0 social applications in the Internet world, it is very likely that the social aspect will be part of many mobile games of the near future. As an example, you can think of games similar to the popular Second Life, a game that emphasize the social aspect of a multi-player game.

Mobile games based on location technologies will be part of the mobile gaming market. An example is Pac-Manhattan, a game that aims at creating a real live version of Pacman around Manhattan. Although this game is simply based on mobile phones to locate users, it shows the potentiality of these games.

Proximity games are an interesting field of next-generation multi-player gaming, as mentioned during the PlayStation Portable presentation (see, Ackerman (2004)). These games make use of close-range wireless networking technologies (e.g., Bluetooth and Wi-Fi) and they differ from classic MMOGs as they require players to be close in space and also differ from classic location-based games since they don’t require the knowledge of the player’s absolute or relative position, but the knowledge of proximity is sufficient (see, Sderlund (2005)). Note that the proximity is not always referred to player, but can also be referred to objects.

CONCLUSIONS

In this paper we analyzed different aspects of the current mobile gaming scenario in order to identify possible directions. As a result, it is likely that the games of the near future will include social aspects, location-based features, alternative delivery models and multi-player capabilities, moving the target on hardcore gamers.

ACKNOWLEDGEMENTS

This work has been partially supported by the Italian M.I.U.R. under the MOMA initiative.

REFERENCES


---

2http://secondlife.com/
3http://pacmanhattan.com/