Ubiquitous Mobile Gaming

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In 2005, 780 million mobile phones were sold worldwide. In comparison, the number of personal computers *in use* – not sold – worldwide in 2004 was 575 million. With 3.3 *billion* subscribers predicted for 2010, the mobile phone is the ubiquitous computing platform of choice.

According to a recent PEW Internet survey, mobile phones have become the Swiss Army knife of media for a considerable number of users, and gaming is ranked among the top applications of interest. [Pew2006] Although market analysts are fairly optimistic about the prospects of mobile gaming – Juniper Research predicts a $23 billion market by 2011 [Juniper2006] – several fundamental barriers will have to be overcome before mobile phones can offer a ubiquitous mobile gaming experience instead of merely replicating conventional gaming experiences.

Mobile handsets are comparable to conventional game platforms (e.g. Nintendo DS) in computing and media processing capabilities. However, they provide the potential for a unique gaming experience because they are continually networked to any information via the data network, and to any person via the communication network. Augmenting the traditional game console with continuous availability of dual networks enables a ubiquitous gaming experience in that you can play with anyone, anywhere and the integration of sensing (e.g. location) capabilities enables the game experience to have a unique physical-digital duality.

The table below summarizes three functional requirements critical to making mobile phones a ubiquitous mobile gaming platform: portability, distribution, and discovery. Interestingly, the past and present functional requirements are similar to those for mobile music.

In the recent past portability was physical, e.g. CDs for mobile music and cartridges for mobile games; distribution was through brick-and-mortar stores, e.g. Tower Records and Circuit City; and discovery was mostly done via traditional media, e.g. radio and magazines.

	Past	**Present**	**Emergent**
Portability	Physical	Digital	Content Platform
Distribution	Brick-and-mortar Stores	Online Portals	Superdistribution
Discovery	Traditional Media	Recommendation Engines	Peer and Social Communities

Today, portability is digital, e.g. MP3/AAC/WMA for mobile music and J2ME/BREW for mobile gaming; distribution is done via online portals, e.g. Apple's iTunes and the Cingular Media Mall game deck; while discovery is done by recommendation engines, e.g. the Yahoo Music Discovery Engine and Sprint Nextel's content deck, which automatically places the best user-rated games at the top.

Game portability is still a significant issue for mobile game software platforms, due to differing device form factors and a lack of standards. For instance, the Java J2ME environment could in theory deliver a high degree of portability, but because many JSR features are flagged optional in practice J2ME portability is a huge problem. Moreover, incompatible J2ME implementations, different screen sizes, multiple language support, and carrier-specific requirements commonly force companies to produce several hundred variants of each game.

A naïve hope would be that mobile gaming finds analogs to the common file formats that have made music ubiquitous. . Perhaps a more realistic solution would be the ubiquitous adoption of an interactive multimedia content platform such as Adobe's Flash Lite. Once mobile gaming finds such ubiquitous content platforms, portability will depend on the legal ways to acquire and distribute content.

The acquisition model that will promote ubiquitous mobile gaming will depend on the existence and adoption of consumer-friendly digital rights management (DRM). Such technology will create a marketplace for additional mobile game content, enable new business models, and reward mobile game developer creativity.

The distribution model that will realize our ubiquitous mobile gaming experience will embrace the basic commercial and technical elements of *superdistribution*. This term was coined by Mori and Kawahara, and their definition is still relevant today: "Superdistribution is an approach to distributing software in which software is made available freely and without restriction but is protected from modifications and modes of usage not authorized by its vendor. By eliminating the need of software vendors to protect their products against piracy through copy protection and similar measures, superdistribution promotes unrestricted distribution of software." [Mori1990]

Our view of ubiquitous mobile gaming as a communicative, collaborative, and contextualized experience requires the ability to create and connect to peer and social communities. Whether or not these are strictly peer-to-peer interactions or involve a centralized intermediary really does not matter from the consumers' perspective.

Many of the underlying raw technology enablers required for ubiquitous mobile game experiences are already in place on conventional mobile handsets, and more enablers will appear in the future. Nevertheless, successfully utilizing these advances in mobile gaming will require the establishment of a technical and commercial ecosystem that does not exist today. We believe a mobile ecosystem that embraces the basic elements of a common content platform, a consumer-friendly DRM to enable superdistribution, and social communities will offer a ubiquitous mobile gaming experience.

References

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