



It is a phone not a console!

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Abstract

You've all heard it before - mobile gaming will be huge because everybody has a mobile phone. However, how can mass-market mobile phones ever compete with handheld game decks such as the Sony PSP and Nintendo Gameboy? These companies have industry know-how, strong gaming brands and large market shares, good marketing engines, interfaces optimized for gaming, better graphics, no device compatibility issues, and business models without major regional differences and several operators to deal with.

Perhaps they should not compete at all. Mobile phone game developers should take advantage of the special characteristics of the device in developing, marketing and distributing new types of games. These characteristics are related to the social nature of the device, e.g. it has an address book that contains your acquaintances and acts as a mediator of messages, it is a portable and shareable picture album, and you can even use it for talking. This combined with the openness of the platforms makes it customizable and moddable in ways not possible with handheld game decks. Also, the network connectiveness of phones combined with extensive coverage of phone networks simply cannot be found in any other portable computer. How can these features be leveraged in creating new forms of mobile entertainment?

Drawing from related phenomena including PC game modding, mobile imaging, Geocaching, Habbo Hotel, and Live-Action Role Play (LARP), we offer fresh perspectives and ideas to professional game developers by presenting research findings in mobile gaming and mobile gaming communities. For example, the cross-media and cross-platform nature of LARP, Geocaching, and Habbo Hotel indicates that the combination of mobile phones and games has the potential to be richer and more immersive experiences. On the other hand, examples like PC modding, mobile photo competitions, as well as LARP and Geocaching, show that with appropriate tools users will come up with innovative game content and even novel game concepts. Thirdly, because the phone is a personal device through which the owner can be identified (i.e., phone number), it has key benefits in billing models, personalization, and trust (e.g., buying virtual furniture in Habbo Hotel).

Introduction

The rapid growth of digital gaming on PCs, game consoles and handheld devices (like the Game Boy Advance) has spurred a range of activity to create new technology and game content for latest generation of mobile devices. The promise of improved processing, sensing, storage and display capacity, combined with ubiquitous network connectivity, will make next generation mobile devices an attractive platform for new kinds of gaming experiences.

However, it is largely unclear what factors will make mobile gaming compelling for consumers. Most of contemporary games for mobile phones are old computer or console games ported to a mobile phone. Nevertheless, new games and new game genres are emerging, where the special characteristics of mobile devices, in contrast to other digital games, are taken more into account.

Our project (Mobile Content Communities at the Helsinki Institute for Information Technology HIIT) is the largest mobile gaming research project in Finland. Strong interaction with our industry partners (e.g., Nokia, Sumea, Sulake Labs, TeliaSonera, Alma Media, etc.) provides us with a more practical point of view than purely theoretical studies. However, as an academic research institute we have been able to study the mobile game phenomena with methodologies and broad objectives that are not possible in business environments. Our case studies have included Live-Action Role Play, PC modding, Geocaching, Habbo Hotel, and mobile photo competitions. We have also researched and used Nokia's open source mobile multi-user application platform called Multi-User Publishing Environment (MUPE).

What makes a mobile phone different?

So what does it really mean that a Sony PSP is not a mobile phone? What are the common characteristics of mobile phones that separate them from handheld game decks? First of all, a major difference is the open programming interfaces that most mobile phones have. Although the variety of platforms is notoriously chaotic, the platforms are programmable by anyone with basic skills. For example, the Java MIDP environment is gaining more and more popularity and broader libraries. Of course, programming environments closer to the operating system, such as Symbian or BREW, are also available but they bring along significant compatibility and configuration issues and are much more difficult to program than MIDP. Nevertheless, the mobile phone as a programming platform have been opened for programming, therefore, the phone seems to be going more towards the "open PC" rather than the "closed consoles". This is a significant difference, which creates low barriers for innovation because, theoretically, now anyone can download the appropriate SDK and start "hacking" his phone (whereas the consoles are tightly controlled environments in that respect). This openness is true even for more console type mobile phones, such as the Nokia N-Gage.

Another technical feature that differentiates the mobile phones from game decks is the inherent network connectivity. Simply because mobile phones are phones, they are designed to be connected all the time.

Add into this the coverage of digital mobile phone networks (e.g., GSM/GPRS) and there is clearly no competition. Also, most of the advanced mobile phones have Bluetooth connectivity for short-range networking, but the main network feature of phones is their unrivalled mobile connectivity.

Because of the network connectivity most mobile games are distributed over the network. This is a mixed blessing: the positive side is that the games are available all the time, there is a working billing mechanism, and installing the game is easy. The negative side is that the current phone networks are quite slow, and have a hard time matching up to the growth of processing power (3D game graphics) and storage capacity (over 1GB MMC) on the phone. Even with a 2MB bandwidth the network might be a bottleneck and downloading a game over the phone network might not be feasible.

Current mobile phones store and manage lots of information about its owner and the people with whom the owner is connected. The phone has social information such as call logs, buddy lists, an inbox for text and email messages, and so on. The phone also has access to contextual information either from the phone itself or the network, for example, time and date, calendar information, presence, and location information such as the network cell ID. One could imagine a multiplayer game where the game has access to all this social and contextual information and thus knows where all the friends are, and if and how they can play the game (e.g., the level of participation in the game may vary if the person is in a car, at home, or at a meeting at work). This is related to the fact that mobile phones are personal devices. Family members often have each a mobile phone of their own, which is personalized and customized starting from the purchase decision of a certain model to the individual ring tones, background images, and downloaded applications. Also, the personalization is not limited to the digital part of the phone: people change phone covers or attach toy animals and key rings to the phone.

In addition to being personalized so that two mobile phones are rarely identical, from the developers' perspective mobile phones are notorious for being a multi-platform device. Unlike game decks or consoles, mobile phones literally come in hundreds of different sizes, colors, hardware, and software. The disadvantage of this is the problem in trying to develop a single game or application that functions on as many phones as possible. To twist the knife in the wound further, the individual platforms themselves are moving targets with changing operating system versions and device specific library extensions. Surprisingly there is an advantage in the multi-platform chaos: a very rapid product cycle. When game decks advance from one model to the successor the life cycle is measured in years – in one year there are few hundred new mobile phone models in the market.

In the context of gaming it is good to bear in mind that for the majority of mobile phone users playing games on the phone will always be a secondary function. It can be argued that most people can live without a gaming device but not without a phone. From this perspective, the comparison between phones and handheld game decks is not reasonable. If a person buying a new phone owns a game deck it will most probably not affect his decision whether to buy a phone or not – it might have an effect on what kind of a phone he gets.

It can be argued that this secondary nature of mobile games is because games on phones are still a new concept for most of the people, and people have a hard time conceptualizing what gaming with a phone might be. Describing mobile games as console games on a phone is not a good analogy because it does not take into account how people see and use the phone as a device. For the majority of people, mobile phones themselves are a very familiar device. This means that it is very intuitive to use it for communication, especially with friends, family, colleagues and so on. Also, with the increasing number of cameras integrated into mobile phones it can be said that people are getting more and more familiar with creating media (i.e., photographs) with the phone. As the camera phone technology advances, mobile phones have the potential to replace the basic two to four megapixel cameras in people's photography habits. It is also good to bear in mind that the phone is an extremely well working, widely accepted, used, and an intuitive audio channel. In combining these three features, it can be said that from the users' perspective the mobile phone is a device, which is used for connecting to acquaintances, mainly by talking and text messaging, and lately, it is being used to take pictures and share them. This kind of a device is different from the mental image that people have of handheld game decks – they are not primarily for keeping in touch and for creating personal media, and one hardly ever talks into a game deck.

Pre-cursors of what is to come

Mobile gaming is still at an early stage of development. In Finland, there are not many communities that are organized around multiplayer gaming with mobile devices. Only the very latest N-Gage titles, such as Pocket Kingdom and Pathway to Glory, have notable mobile multi-player features. Also there is very little community-created content creative, or active modding, in the existing mobile gaming communities.

In our research, we have wanted to look beyond the narrow definition of mobile gaming happening on portable handsets and small screens. Also, we did not want to be too strict on the definition of "a game" and instead looked for clearly social game-like activities, which may influence the emerging genres of mobile games. We decided to mostly focus on community activities that are not currently using mobile phones or other networked mobile gaming devices as their main technology platform. For our study, we selected activities and communities that seemed most promising for providing fresh perspectives on how mobile gaming might evolve.

PC modding

Many PC game developers have realised that allowing gamers to make expansions and modifications to existing games, even if these products are copyright-protected, is a good model for building community amongst gamers and thus increasing customer loyalty. User-created content (UCC) in games has become popular as demonstrated by game-related skins, mods and extensions, screenshots, gameplay videos, game narratives, walk-throughs, websites, articles, fan art, as well as tools for creating the content. In addition to enthusiasts who create their own original game content, game companies are providing tools and

games that are designed to be extended, or customized. Also, with current tools and technology the user-created content can be of very high quality and can occasionally be more innovative than the content produced by the game companies themselves. Community of amateur content creators can also create an identity and a virtual location around their activity, which acts as a publicity and distribution channel for the content, a discussion forum, knowledge pool, and a place for socializing.

By leveraging the community innovators, game developers can draw on the resources of the community, including users' time, ideas, experience, etc. With the release of tools for modifying, customizing or extending games, customers are able to create exactly what they want without requiring the firm to act as their agent. Through these toolkits, the firm can satisfy the needs of customers that otherwise would have been too small and therefore too expensive to deal with [Herrera & Turpeinen, 2005].

Because the mobile development environments are becoming increasingly open, mobile modding communities – somewhat similarly to the PC game modding – are likely to emerge in the mobile gaming domain. However, this requires new platforms and tools that make the mobile content creation and customization easier.

Mobile Phone Photography

Currently mobile phone cameras are the most sold consumer digital cameras in the world, which means that picture taking with a phone is becoming an everyday activity where certain distinguishable uses have emerged: photo blogging and picture messaging. In photo blogging pictures taken with the phone are uploaded to a website similar to weblogs. Picture messages from phone to phone (e.g., MMS) is another way of sharing the photos. It has its background in text messaging and email. Due to the communicative nature of phones, picture messages are sent to friends and family - they are the ones whose contact information is readily available. Also, especially in photo blogging, the pictures are sent to a predefined web address and are automatically published there.

We chose mobile pictures as one of our background research areas because it demonstrates the existing social activities that combine user-created media and mobile phones. Picture taking itself is often a social activity, and with networked cameras such as mobile phone cameras, picture taking becomes a collaborative activity where the created media can be immediately shared and combined over the network.

Our research on mobile picture sharing indicates that the pictures and comments people share are very much like in traditional photography: events, people they know, and places and objects that are either aesthetically pleasing or symbolic. However, much of the interaction around mobile phone pictures is joking, storytelling or just playing. People comment and photograph themselves or their friends in a humorous manner, and create humorous meanings to pictures by the written captions. The immediacy and interaction made possible by mobile phone technology seems to turn the social activity fuelled by the pictures into a play-like activity, which has an entertainment value in itself [Sarvas et al, 2005].

Mobile picture sharing also demonstrates that people are willing to pay for sharing and playing with media. In mobile picture sharing the sender is charged either for each picture message sent, or by the amount of data traffic over the network.

The lessons learned from mobile pictures that can be applied to mobile gaming is that people are already socializing using the phone, and the socializing revolves around media content, which is created, viewed, and discussed collaboratively. This socializing has a play-like quality that, in a broad sense, could be seen as a social game among friends, relatives, and acquaintances. For mobile phone users, the step from existing media-related social activities to social mobile gaming is intuitive. From a gaming perspective it can be said that mobile photography is a non-immersed activity and playing that is different from computer games. Mobile picture taking and sharing also supports leveraging existing social groups (i.e., friends and family) in creating social activity. Playing with friends and family whose contact information is stored on the phone is rather different from finding previously unknown opponents from a virtual meeting place.

Geocaching

In Geocaching (www.geocaching.com) the core activity is Internet-mediated outdoor treasure hunting with the aid of a GPS device. The hunt trip is planned in advance by choosing from a list of caches and their locations at the community's website. When the hunt is over, it is reported on the community website, and one more credit is gained from this latest "found".

The activity has rapidly gained popularity around the globe. In January 2005, there were 136,797 active caches in 212 countries. The players create and re-create the game fully themselves, and it is a good example of user-created content that is truly mobile. The game does not currently involve any significant role for the use of mobile phones, although some mobile phones that include GPS positioning do exist on the market. Some players also download the necessary maps and hints from the Geocaching website to their mobile communication device (PDAs, mobile phones, etc.). Naturally, the Geocaching website can also be accessed through a regular Web browser client running on the mobile device, if network connectivity is available.

Cache creators can be motivated by 1) competing on who finds the most caches, who finds new caches first, or who finds particular cached items called "travel bugs", 2) having the possibility of becoming famous as a creator of certain type of caches, 3) contributing to the people and the community, and 4) being a part of a big, widely spread hobby. However, it is questionable whether Geocaching is really a game, a social play, or just an innovative excuse to do exercise outdoors. In our opinion, it is all of these simultaneously.

Mobile gaming can have a secondary enriching role to some other activity, e.g., outdoors exercise or biking and socializing. Geocaching also shows that Mobile Augmented Reality (MAR) activities can be implemented with relatively low-tech equipment, and they do not need to be 100% immersive.

Live Action Role Play

Live-action role-playing games (LARPs) are organized events where players gather together to experience living in a fictitious world. Typically, LARPs are situated in fantasy worlds, but there are also many games that explore gender and political issues of today's society. The goal of these sessions is to create an immersive illusion of an "in-game" world, where people act out game roles. These roles have been crafted for each participant beforehand with some level of pre-scripting, but also leaving plenty of room for improvisation for the players.

To increase the sense of immersion, the gamers augment their gaming world with props, costumes, sound effects, etc. However, the gamers tend not to use technological devices in enriching their LARP sessions. If they do, the technology needs to be carefully crafted and disguised as belonging to the game world to not to break the in-game illusion.

The core community of LARP gamers typically consists of a group of regular members, but often there are participants in a LARP session that do not know each other "in real life". LARPs are organized by game masters (GMs). From them, arrangements require a lot of effort before the event: writing descriptions of fictitious game characters for each participating player, match-making players' wishes with the set of available characters, and finding and arranging the milieu where the game can be played. Because of the large amount of work preparations for a game require organization, are usually started months in advance, and are often carried out jointly by multiple GMs [Salovaara, et al., 2005].

Although the preparations are laborious, being a GM is quite popular. Reasons are diverse: one has a possibility to do something creative, publish one's creative works, make people happy, get players to have "common play" together, see how one's fictitious world comes alive, gain reputation in the community, write a game that no-one has yet realized, and be together with friend.

LARPs are good examples of completely user-created game content with a strong emphasis on captivating storytelling. In addition to the thrill of seeing how one's fictitious world comes alive, people are socially very active in organizing and creating LARPs.

Habbo Hotel

Habbo Hotel (www.habbo.com) by Sulake Labs is a graphical chat and game environment for teenagers where every user plays a simple cartoon-like character. The Habbo Hotel has less emphasis on hard-core action but more on entertainment and social aspects. There is no subscription fee, but if you want to decorate your own hotel room, you have to pay for the furniture. This is the core business model for the Habbo Hotel. The payment for these virtual Habbo objects is typically done with a mobile phone.

Habbo Hotel has become very popular among people with 10-14 years of age. Rich social activity has emerged within, and around, the Habbo Hotel. Although one of the main user motivations is to socialize in the virtual space provided by Habbo Hotel, other more game-like activities are also major drivers why people

are willing to invest their time and money into Habbo. The virtual goods can be traded in-game, which has resulted in a competition for most valuable collections of Habbo "stuff". The users have also invented their own ways of having fun in the virtual world. They use the rather simple and primitive virtual Habbo objects in clever ways as building blocks for social play. This idea of collaboratively created mini-gaming was not designed originally into the Habbo platform and has emerged as players have started to explore the possibilities of the environment. Sometimes strong limitations in the virtual world can actually foster creativity amongst the gamers to come up with the most innovative solutions with the means available.

The popularity of Habbo Hotel has also resulted in a large amount of Habbo-related fansites, which are good examples of user-created content related to games. However, there are many issues with brand identity regarding the use of game-related artefacts in fansite content creation. This has resulted in Sulake Labs monitoring and controlling, how the Habbo Hotel brand is used in these websites.

By the beginning of January 2005, the Habbo Hotel has not been extended into the mobile game domain. However, using the mobile phone as a familiar personal wallet has solved one the bottleneck of ease of payment regarding the gaming content.

Discussion

Current trends in commercial mobile game development seem to follow the path of games made for portable game decks rather than taking advantage of the special characteristics of a mobile phone. Presumably, porting well-understood game concepts onto the mobile phone presents a smaller financial risk in the form of familiarity in marketing, development, and user adoption. As we have presented above, there are game-like phenomena that leverage sociality, connectivity, media creation, and mobility. Furthermore, the phones are very personal devices; they know a lot about the user and lend themselves as vehicles for self-expression. Also, the phone can be a part of richer cross-media concepts, phones enable an alternative way of billing for gaming content, they are a communication medium for TV entertainment, and a source of extra information when playing in the real world. These characteristics can and should be used to differentiate mobile phone games from game deck games.

Therefore, game developers should not limit themselves to porting game concepts to a smaller screen and multiple platforms when thinking about developing mobile games. Drawing from existing phenomena we argue that mobile phones are a new type of a gaming device with special characteristics, and taking these characteristics into account opens up an opportunity for game designers to develop games that are truly unique to the medium.

However, the learning curve for consumers to understand what mobile gaming can really be about should not be underestimated. It is already hard enough to communicate to people about basic mobile games. Perhaps this is the reason why simple mobile games like bowling are very popular. One approach could be to gradually add features that leverage sociality, mobility, connectivity, self-expression, phone billing etc. into mobile game concepts that people are already familiar with. Then move towards more innovative concepts

as the mainstream market becomes used to the special characteristics of mobile gaming. Another approach would be to introduce the mobile phone as a gaming device into game-like activities where these features already exist and the concepts are familiar. For example, Geocaching combines connectivity, mobility, and sociality, and online betting, which is a well-known and popular game format, combines mobility, sociality, money transfer, and cross-media.

Either way, one thing is certain, mobile gaming will eventually mature into its own unique form of expression.

Future work

Rather than just writing papers and giving talks about mobile gaming we base our research on building working prototype systems to test our hypotheses. Therefore, our future research explores the issues discussed in this paper, namely how mobile phones special characteristics could be taken into use in existing game activities and in facilitating the creation of user-designed and implemented games.

We have currently under development an online prediction league engine with a mobile phone extension. The engine provides a customizable website and a mobile client for friends, families, or colleagues to use for predicting, for example, sports, television shows, or their own activities, such as junior sports leagues. Predicting results, or betting on them, in a group is a popular, familiar, and well-known game with strong social ties. The goal of our prediction league system is to study how predicting or betting can strengthen the social ties of a group and what role do mobile phones have in this gameplay, especially in socializing and communicating. As mentioned above, online predicting and betting is the kind of game activity where many of the special characteristics of mobile phones exist, but there are no mobile games that take advantage of this that we know of.

Another future work of ours is hosting the MUPE developer community. MUPE is a multi-user context-aware applications development framework and toolkit developed by Nokia Research Center. MUPE is an open platform built on J2SE on the server side and J2ME/MIDP on the client side. The idea of MUPE is to provide an open and easy development platform for people to build their own games and applications for mobile phones.

We are also building a MAR (Mobile Augmented Reality) Toolkit on top of MUPE. The toolkit consists of open components for programmers to take advantage of. These components leverage the fact that the device used is a mobile phone and the characteristics associated with it, mainly mobility, picture taking, mixed reality, and network connectivity. The components of the toolkit are a Physical Object Tagger that enables users to identify tags in the real world using the built-in camera of their mobile device, a Public Display that shows a view to the ongoing and changing MUPE game world, and a Map Interface that can show location-dependent maps and overlay graphics on top of the map.

Both of these systems, the Prediction League and the MAR Toolkit, will be available for public use in the beginning of Summer 2005. The MUPE platform is already available (www.mupe.net). Also, the lessons learned and research done using these systems will be published.

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