

Mobile Gaming Communities: State of the Art Analysis and Business Implications

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Abstract. *Virtual communities have been formed since the beginning of the Internet. With the progressive diffusion of internet-capable mobile device, mobile communities are becoming increasingly important not only for commercial service providers but also as a research topic. This paper is focused on mobile gaming communities, the current state of scientific research and implications for commercial set up and maintainance of those communities.*

To provide a basis for further scientific research, extensive analysis of present research results in the areas of online and mobile communities by examining relevant publications in this matter was conducted. Critical success factors for building and operating mobile (gaming) communities could be extracted and those results were evaluated in focus groups with key users.

Keywords. CECIIS2011, mobile community, mobile gaming, mobile gaming communities

1 Introduction

This Paper is based on the study ‘*Mobile Gemeinschaften – Erfolgreiche Beispiele aus den Bereichen Spielen, Lernen und Gesundheit*’ (‘*Mobile Communities - Successful examples from the areas gaming, learning and health*’) [1], which has been published by the authors of this paper in January 2011.

Nowadays mobile phones are still mainly used for voice calling and sending text messages. For the Austrian market, the amount of voice minutes as much as the number of text messages sent both show a steady increase over the last two years [2]. But with smartphones gaining more and more market share (44% of mobile phones shipped in Western Europe in

Q4 2010 have been smartphones [3]), the number of people going online with their mobile devices increases rapidly. In German-speaking countries, the rate of mobile phone users going online with their devices lies between 17% (Germany) and 31% (Austria) [4]. With people accessing the World Wide Web from their mobile phones, for enterprises and entrepreneurs the concept of mobile communities reaches a higher level of interest.

While there are various studies and reports published covering the process of building an online community [5] and identifying success factors for online-based communities (for an analysis of success factors mentioned in selected publications see [6]), the field of mobile communities has hardly been in the focus of scientific research.

2 Mobile Communities – definitions, classification and relevant technologies

2.1 Expectations towards mobile communities

From a business perspective, expectations are that people get an added value for being part of a mobile community (compared to the value they receive for participating in an online community) so they are (even more) willing to spend money on the products or services offered by the provider of the community [7].

The expectations for monetizing mobile communities are high: Forecasts expect the market for location-based mobile social networks to reach revenues of 3.3 Billion US-\$ by 2013 [8]. But also other goals for developing a successful, business driven mobile community cannot be discounted, like increasing customer loyalty, supporting innovation

processes or boosting informal learning and know-how transfer.

2.2 Definitions of a mobile community

Originally, a community was defined as individuals who are spatially and/or familiarly connected and follow similar objectives and moral concepts.

With upcoming technologies, from telegraphy and telephony up to today's mobile communication and the internet, spatial connection was no longer a crucial factor for being part of a community. With the rise of the World Wide Web, the phenomena of people intensively exchanging their opinion on a certain topic over a longer period of time and therefore getting to know each other and follow similar objectives, often physically located far away from each other, could be observed. One of the first studies researching this phenomena defined these types of 'virtual communities' as *'social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace'* [9]. Another, more recent definition for online communities speaks of *'people with common interests, which use the web or other means of communication to exchange opinions or jointly create content on a regular basis, at the same time develop strong ties and feel socially connected'* [10].

So what distinguishes mobile communities from online communities? The main differentiation is the *'additional or exclusive accessibility by mobile devices, like smartphones, PDAs (Personal Digital Assistants) or Tablet PCs and communication services especially designed for this kind of access'* [7]. Also for Tasch/Freimuth the access to those communities is essential: *'Mobile Communities are accessed by mobile devices such as cellphones, smartphones or PDAs'* [11]. By using mobile devices and the features they offer, new types of interaction emerge, e.g. location-based services like geocaching - a game where the community members hide and search for items or notes in a real environment by using the GPS-functionality of a mobile device.

We define mobile communities as people with common interests, who use the web or other communication technologies with their mobile devices to exchange opinions and/or jointly generate content on a regular basis, therefore develop strong ties and feel they belong together. The members of the mobile community act spatially independent and do not necessarily move around together.

2.3 Classification of Mobile Communities

A classification of mobile communities can be performed from different angles and with different objectives.

2.3.1 Classification by level of utilization of mobile devices

When looking at the level of utilization of mobile devices, three categories for mobile communities can be identified. The following scheme was developed based on the authors' own observations:

Mere mobile communities: communities which are solely used with mobile devices, such as text message based communities.

Mobile communities with online-access: communities which are designed for the usage with mobile devices or actually require a mobile device to take part in the community, but additionally offer web-based information (like a forum).

Web communities with mobile access: A community designed for online usage via a personal computer, which can also be accessed with an internet-ready mobile device.

2.3.2 Classification by objectives

In a classification provided by Rhee/Lee [12] the distinction of mobile communities is based on the factors social vs. financial objectives and stable vs. dynamic communities. These two dimensions given, four classes of communities can be identified:

- Efficient Work: communities, based on financial goals and more stable or fixed
- Qualified Services: communities, also based on financial goals but more dynamic or temporary
- Reinforcing Relations: based on social goals and very stable or fixed
- Seeking Entertainment: also based on social goals but dynamic or temporary

As Rhee/Lee state, *'any individual might be a member of all four types of communities'* [12].

2.3.3 Classification by mode of communication

El Morr/Kawash [13] see the degree of openness, the extent of context information which one gets about other community members and the type of interaction (synchronously/asynchronously) as main dividers to classify mobile communities.

2.3.4 Classification by origin of information

A study by Informa Media and Telecom [14] comes up with a classification which is based on whether the content and/or topics of the community are user-generated (by the members themselves) or not.

2.3.5 Classification of selected mobile gaming communities

During the study [1], we performed a deep analysis of relevant mobile gaming communities. They were

determined by interviewing members of the focus group. Below an excerpt of the analysis is given:

TibiaME

- Tibia ME is a massive multiplayer mobile role playing game (MMMRPG), supporting a wide range of mobile phone models.
- It can be classified as a mobile community with online-access, as it offers e.g. leaderboards and a forum on its website.
- According to the classification by Rhee/Lee, its community members are seeking entertainment.
- Classified by mode of communication it meets the criteria of a private, non-contextual and synchronous community
- The content of the game itself is not user-generated, although the community members' inputs play an important role in the further development of game content and challenges. But the main topic of the community is the game itself, thus set by the publisher from the start.

Join the Pirates

- Join the Pirates is an Augmented Reality Game (ARG) published by the consultancy company Roland Berger for a recruiting purpose.
- This ARG is set up as a mobile community with online-access.
- It can be classified as a community for qualified services (in the long run), as the game publisher seeks for future employees.
- By using the classification by mode of communication, it has to be seen as private, non-contextual and synchronous.
- The game content is not user-generated, but essential parts of the game can only be mastered by considering other users information and achievements. The community's main topic is the game itself.

Parallel Kingdom

- This location-based mobile multiplayer game for smartphones places a virtual layer on the gamer's whereabouts to fight against monsters and trolls, hunt deer, loot gold and other resources and therefor build a basis to protect or expand his virtual kingdom.
- Parallel Kingdom is organized as a mobile community with online-access, offering features such as buying virtual goods, exchanging opinions in forums or look at various leaderboards.
- The main objective for the community is entertainment.
- According to the classification by El Morr/Kawash, Parallel Kingdom is a private,

contextual and synchronous gaming community.

- The main topic of the community is the game itself, set by the game developer.

Further details on the above listed mobile gaming communities and an analysis of other communities are given in the study [1].

2.4 Relevant Technologies

To participate in a mobile gaming community, the user has to have a mobile device to perform operations, an available (wireless) connection to the community server and the minimum required bandwidth, which strongly depends on the kind of interaction and/or game, to execute actions without critical lags.

2.4.1 Mobile Devices

The following groups of devices can be identified as the most important when observing mobile communities [15]:

- Mobile phones
- Handhelds or Tablet-PCs
- Notebooks

In this paper we focus on mobile communities which are accessed via mobile phones. In the dynamic field of mobile communication, some milestones for a changing communication behavior can be identified.

Selected milestones in the development of mobile phone usage (focused on the Austrian market)	
1946	First 'mobile' call
1974	B-net launched in Austria
1983	Registration of the first mobile phone in Austria
1991	2G(GSM)-Net established
1992	First text message sent
1998	First mobile advertisement
2007	Amount of text messages tops voice minutes

Milestones for mobile communication development, based on information from Pearson [16]

2.4.2 Wireless Networks

Mobile devices are usually connected via wireless networks. According to their reach they are divided into three groups of networks [17]:

- Wireless Wide Area Networks (WANs): Wireless global networks are commercial, cellular mobile networks of the 2nd generation (2G, GSM) or 3rd generation (3G, UMTS), where one client can connect to any other client globally.

- Wireless Local Area Networks (W-LANs): cover locally limited areas where one client can access other clients within the network; often those networks are connected to a WAN
- Wireless Personal Area Networks (W-PANs): characterized inter alia by a range of a few centimeters up to some meters. Assigned to communication or data transfer between mobile clients and/or devices located close to each other via Bluetooth or the infrared port.

In the area of mobile communication networks, a steady progression of mobile communication standards led to increasing bandwidth and data transmission rates.

Category		Standard	Bandwidth
1G	1958-1977	A-Net	
	1972-1995	B-Net	
	1986-2000	C-Net	
2G	Since 1992	GSM	up to 14,4 KBit/s
2,5G	Since 1999	HSCSD	up to 38,4 KBit/s
	Since 2001	GPRS	up to 114 KBit/s
	Since 2002	EDGE	up to 220 KBit/s
3G	Since 2003	UMTS	up to 384 KBit/s
3,5 G	Since 2006	HSDPA	up to 14,4 MBit/s
Super 3G / 3,9G	Since 2010	LTE	up to 100 MBit/s

Mobile Communication Standards

2.4.3 Technological Aspects of Mobility

To explain the meaning of the term ‘mobility’ in a technical perspective, a distinction by Schulzrinne/Wedlund [18], expanded by van Beijnum et.al. [19], has to be mentioned. According to this definition:

- Terminal Mobility enables the user to connect to networks while on the go.
- Session Mobility supports upholding a session when switching terminals.
- Personal Mobility is technically defined as the ability to simultaneously address several different terminals.
- Service Mobility describes the ability to switch between different devices or service

providers. This includes all personal configurations and preferences.

3 Mobile Gaming Communities

As mentioned before, we focus on mobile communities accessed via mobile phones. Essential for a mobile gaming community is that several (more than one) gamers are playing simultaneously, interacting, compete against or cooperatively play with each other. Those kinds of games are defined as Mobile Multiplayer Games (MMG).

We describe the evolution of mobile gaming, some key market figures, list relevant players in the value chain and their respective business model opportunities.

3.1 Mobile Games and Mobile Devices

Currently, MMGs are primary based on accessibility via mobile phones or mobile interfaces for online multiplayer games. Multiplayer gaming on handheld consoles (such as Nintendo DS or Playstation Portable) hasn't yet reached a wider audience or is just not available because of the missing feature to connect with wireless networks. But these kinds of portable devices are predicted to boost the mobile gaming market as mobile console manufacturers (e.g. Sony) aim to target the mobile gamers with hybrid devices of gaming console and mobile phone.

For the evolution of mobile gaming towards mobile multiplayer gaming, the following table shows selected milestones:

1970	First electronic games
1989	Nintendo Game Boy, Atari Lynx/Lynx II
1996	Tamagotchi
1997	First mobile game ‘Snake’ preinstalled on Nokia 6110 mobile phones
2003	Color displays for mobile phones become the standard First 3D-games for mobile phones
2007	Touchscreens Apple iPhone released

Evolution of Mobile Gaming

3.2 Market Data and Forecasts for the Mobile Gaming Sector

According to figures published by Deutsche Bank Research [20], the German market for mobile games increased by 52% CAGR from 2003 to 2007. Worldwide, the mobile gaming market was worth US-\$ 5.6 Billion in 2010, expected to double until 2014, a study by Gartner shows [21]. According to this study, 70% to 80% of all mobile applications downloaded by users are mobile games.

Key factors for the market growth are assumed to be location-based services and new technologies like Augmented Reality.

3.3 Business area mobile gaming communities and business models

Compared to other fields of application (e.g. the health- or learning-sector, which are both further examined in the underlying study [1]), the area of mobile gaming communities can be considered as the most interesting and promising business area for technology providers, such as mobile phone providers and mobile network operators. A rather large target group can be addressed and the market has already evolved to a stage superior to other business areas.

The area of mobile gaming and mobile gaming communities is a main area of research for the research departments at e.g. Nokia [22] and Motorola [23]. Besides technology relevant matters, also user needs and user behavior are key factors in the research departments at the mobile phone/service providers [22].

The different players in the value chain see various opportunities to grow their business with mobile gaming communities:

- Service providers are interested in significant gains in opportunities for communication, service utilization and customer loyalty through collaborative mobile gaming which eventually leads to profit growth.
- Mobile handset manufacturers expect an increase in sales by required new developments and adjustments of mobile devices.
- Game developers and publishers are pulled into the market by the relatively low development costs (compared to other platforms such as consoles or personal computers) for the mobile platform.

The importance of MMGs will strongly depend on the future pricing of mobile bandwidth connections [22].

Regarding the business model, an analysis of online gaming communities had to be added as an analysis of existing mobile gaming communities showed a lack of well-functioning business models for MMGs.

- Game developers: Online multiplayer games are not only developed for an end user market (where publishers and/or service providers often also take a part of the revenue if not distributed direct to market) but also as commissioned work for use as an ad game. The relatively low costs for the development of mobile games offers opportunities in both fields, but the low

pricing in the end-consumer market for mobile games has to be considered.

- Mobile handset manufacturers only participate in the value chain by delivering the handsets needed for mobile gaming.
- Mobile network operators (MNOs) have some options for positioning themselves in the value chain. At first hand they benefit from the increasing data transfer and special bundles they can offer to mobile gamers. Also, mobile gaming requires certain handset functionalities, often found on handsets in higher price segments. But MNOs can also position themselves as service providers, reaping the revenues on this point of the value chain.
- Game publishers/Service providers: Monetizing mobile gaming communities can be done by pricing the initial game purchase and/or charging a monthly fee, offering in-game purchases or a freemium model for the user to unlock the full functionality of the game only for a fee. Also some examples could be found where the service provider keeps a transaction fee for transactions made within the game between gamers (e.g. buying/selling game items where the in-game money has to be bought with real money). Those are all revenue models which already exist for other platforms like online gaming. For mobile gaming, mostly the freemium model, virtual goods and the pricing of the initial game purchase can currently be observed.

This chapter only shows selected facts on business models for mobile gaming communities, extended information are given in the underlying study [1] and can be found in Perry [24].

4 Key factors for successfully building a mobile gaming community

Additional to the common success factors for building a prosperous community [5], the following specifics for the mobile game itself and/or the mobile gaming community, as partly mentioned in Tiago/Licínio [25], discovered in focus group workshops with mobile gamers and extracted through extensive literature review, are assumed to be important:

- The mobile game – not necessarily the community – has to be entertaining and bring joy to the gamer.
- There are many indicators for a successful game design such as challenges that are matched to the gamers' skills, therefore offering skilled gamers as much fun with the game as rookies. The 'concept of flow' by

Csikszentmihalyi [26] can be considered relevant in this context.

- The gamer demands feedback at regular, short intervals. This can be conducted by rewards for experience gained within the game.
- Maintaining the quality of the gaming experience is a critical success factor when keeping a gaming community alive. *'They [the members of the gaming community] can choose not to play. If the players leave the game en masse, the whole business model collapses since the act of playing is directly related to the act of paying, which in some cases, is the only source of income [...]'* [25]
- Classic and well known gaming concepts where the user already knows the rules and procedures seem to have a higher acceptance and faster adaption among mobile gamers, also when they are adjusted to the functionalities of the mobile device.
- Especially for mass-multiplayer games where it is essential that a certain amount of other gamers has to be active and available all the time, gaining a critical mass of gamers is essential. *'There are actually two critical masses: one from the player's point of view ("is this world empty?") and one from the developer's ("is this product breaking even?"). While either of these conditions is not met, the virtual world risks failure.'* [27]
- The technical requirements and barriers are often – but not necessarily – higher for mobile gaming communities (compared to other areas like mobile communities for health-related or learning-related services), because in many cases more advanced systems are necessary for operation of the gaming and community framework, a large variety of mobile phone devices has to be supported and a high number of users has to be handled by the system. [25] [28].
- Interviews with mobile gamers, conducted for the study [1], revealed that, especially for games which require a synchronic interaction among the gamers, the voice calling feature of the mobile phone is perceived as disruptive for interrupting the game.

5 Present situation of mobile community research and future prospects

Although mobile community research is a rather new area of investigation, some research outputs are already published and partly verified. The following aspects are considered important not only for service

configuration but also for further research activities [7]:

- The ubiquity of mobile communities leads to a disappearance of the personal computers' restrictions.
- Mobile devices are 'always-on'
- While in online communities fake and/or multiple identities can easily be set up, for mobile communities more often the real identity of the community member is given. A real, unique identity is considered a trust-building aspect.
- Context sensors allow an *'automated detection and analysis of contextual information of the user'* [7], thus enabling the service to display e.g. the whereabouts of a user to other community members or the transmission and reception of asynchronous, location-based messages.
- As the mobile phone offers a rather small display, compared to other platforms, the game design as much as the interaction options among community members have to be adapted to this fact.
- The mobile phone has a positive, emotional connotation as it is mostly carried close to the body and is a very personal means of communication.
- For a number of researchers, privacy aspects (settings for data privacy and mobile exchange of data) are important factors in setting up mobile communities and the further development of mobile community research. Those and other considerations result in a recommendation to conceive mobile community applications as a privacy-trust decision problem [29] [30].

With several propositions found during extensive literature review, there is plenty of room for formulating further research questions regarding mobile communities and mobile gaming communities. Selected statements and prognoses are:

- With the ubiquity and private characteristic of mobile devices the communication behavior is more emotional and spontaneous [7].
- Community applications will probably be used primarily amongst young people for personal communication, as for exchange with the personal network and (close) friends [7].
- Mobile communities are probably less subject-centered but more person- and communication-centered.[7]
- In mobile communities and mobile services user classify their personal data as very sensitive and handle their data in a more sensitive way [30].

6 Conclusion

Although scientific research on mobile communities and even more mobile gaming communities is only at the beginning, some concepts and findings in online/virtual community research seem to be fitting also for this research matter.

A mobile gaming community is first of all a virtual community which has some peculiarities due to its main topic (gaming) and the device and network the user accesses it. The (online) multiplayer gaming market is a market characterized by its dynamic development and it differs from the conventional gaming market in crucial aspects, e.g. the dominant revenue model which tends towards a fee-based model, freemium model or charges for virtual goods.

For mobile communities, further differences to online communities can be observed due to the contextual information which can be integrated into the game concept and the ability to augment the user's reality via the mobile screen.

Research questions we focus on for following research activities will be as much security/data privacy related as focused on user interaction within mobile communities: which personal data do users provide in public/private communities, which contextual data can be considered to boost user interaction amongst community members and for what reasons dominant and popular gaming concepts receive attention by the gamers.

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