NEW BUSINESS IN COMPUTER-MEDIATED COMMUNITIES

Edited by

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Introduction

The Internet, mobile phones, and ”being online” are no longer a novelty. Social interaction in computer networks is becoming an everyday activity: we meet people in cyberspace that we probably will never meet in the physical world, we are quite used the effects of anonymity in the virtual world, and our perception of the Net is shifting from a network of computers to a space for meeting and interacting with people. Also, the networking and processing capabilities of mobile phones are extending the online world into wherever there is phone network coverage.

Communities and people interacting with each other is by no means a new phenomena for fields such as sociology, economy, urban studies, psychology, and anthropology. However, the traditional rules and conducts of interaction change when a physical world is augmented with a virtual world and vice versa. The study of these new and different ways of interaction in cyberspace and physical space has become a popular topic, not only for social sciences, but also for software engineering and business studies. Computers and networks enable this merging of physical and virtual social interaction, and, therefore, the resulting communities can be called computer-mediated.

Software engineers and programmers have designed and built tools for the people of these communities to interact more easily and to unleash the potential creative power of the masses. Examples of these tools are enabling people to modify and share their own versions of computer games (*i.e.*, “modding”), and tools for like-minded people to find each other and collaborate online. The developers of these systems have been thrilled to witness the wide adoption and rapidly growing usage of these systems.

Businesspeople are no less excited about the new phenomena and opportunities in computer-mediated communities. Like the World Wide Web, most of these communal cyberspaces have formed with no explicit commercial objective, for example, open source software developer communities. Therefore, companies are eagerly looking for business models that would leverage people’s strong need to socialize online, and their creativeness to invent new ways of socializing with computers.

This publication is the outcome of a seminar course (T-86.750) held at the Helsinki University of Technology in the Spring of 2004. The backdrop of the seminar was New Businesses in the Digital Economy and the focus in Spring 2004 was Computer-Mediated Communities. The seminar participants produced a set of evaluated case studies and concept designs in the form of eight research papers. The papers went through a review process and the final papers are for you to read in the following pages.

The objective of the papers was to present realistic and well-grounded studies into the ongoing discussions about business potentials in computer-mediated communities. The final papers are divided into three broad research themes, which all explore and evaluate the mechanisms business potential of computer-mediated communities.

The first theme is leveraging communities in creating value to a service. The first paper (Jokinen & Dudas) discusses alternative and demo music websites and how they could take advantage of user communities in filtering, rating, recommending music in addition to having a forum for supporting unsigned bands. The second paper in this theme (Pilawski) looks into the common problems in peer-to-peer file sharing networks (*e.g.*, free-riding and malicious behavior) and how communal aspects are helping and could help to solve these issues. The third paper under this theme (Ajalin, Granö, & Nyberg) looks into online betting on a virtual soccer game and how the key problems of this domain (*i.e.*, trust and control) could be solved by having a strong community around the game and the betting.

The second theme in these papers is how existing online communities can be used to create business. The first paper under this theme (Ahokas & Laurila) discusses open source software

communities and how businesses could take advantage of them. The second paper (Kalli & Happonen) analyzes weight-losing communities and the current state of business involved in them.

The third theme focuses on the critical mass of users required to make a community-based business prosper. The first paper (Hacklin, Kontio, & Pöyhönen) introduces a location-based mobile gaming concept which relies heavily on gamer community activities, and where the creation of sufficient number of users is critical. The second paper (Kauppinen & Rissanen) goes through different methods of promotion to achieve the critical mass of users. The paper also presents a model for selecting a suitable promotion method. The third paper of this theme (Anttila & Backlund) discusses the issues and opportunities in mobile instant messaging, that is, how the number and networks of users change as mobility is introduced to the social networking of instant messaging.

The editors would like to thank all authors and seminar participants for their effort, comments, discussions, and enthusiasm. The topic of the seminar was challenging due both to the interdisciplinary nature of the field of study, and to the scarcity of established literature and real-world examples. However, we are proud to present the results of the seminar, and we believe that all of these studies make a contribution to the uncharted area of making business with computer-mediated communities.

Helsinki, August 6th, 2004.

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Emerging business opportunities of alternative / demo music communities

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Abstract

In this seminar work we present analyses of communities around different kind of music mainly focusing on alternative / demo music web sites from business and community perspective.

The main objective of our study is to address emerging business opportunities that can be found by adding value to community members and taking advantages of promotional possibilities that lie within.

1 Introduction

The music industry long time ago has not seen such a rapid and radical change as it has witnessed since the beginning of the new millennium. Since Compact Discs were introduced and became mass products the music industry has had a calm period a while the sales kept on growing for fifteen years. The late 1990's have brought fundamental changes to the music industry.

The major cause for the revolution in the music market was due to the high level of digitalization achieved in the entertainment business. More and more songs, videos or even movies became available in digital format, as a result copying was easier while the same quality level could been maintained. The other important outcome of digitalization was the use of more advanced compression techniques that reduced the size of the digitalized songs significantly.

The second huge boost that led to the changes in the music business was the growing penetration of Internet hosts. Although not only the high penetration rate contributed to the change but the fact that the Internet Service Providers (ISPs) started to offer cheap broadband access to their subscribers.

The high penetration of Internet, the compressed size and the higher bandwidths available created a new legal – but also illegal – market for music. The appearance of this new market had a double impact on the music industry. The Internet based online music market generated new revenues, meanwhile on the traditional CD market big music publisher faced a break in the fifteen years of growing trend and since the end of the 1990's they have been witnessing a decline in sales according to the data of International Federation of Phonographic Industry (IFPI).

The launch of the online music industry dates back to 1993 when Internet Underground Music Archive (IUMA) was established to promote and sell compositions of unsigned artists and bands. IUMA had some followers, although the major record companies did not want to participate in making their catalogues accessible. The next wave of online music companies offered songs not just from unsigned artists, but from signed artists as well. As a result they had to cope with copyright issues, which they failed. In the third phase sites like Napster or Audio Galaxy emerged, where users were exchanging their music files on peer-to-peer (P2P) basis. The file sharing of copyrighted content on P2P basis has been found illegal in several verdicts, thus these sites were either shut down or were taken over by record companies that developed the sites into legal song markets. The latest generation of online music sites is run by the big record companies where they are selling the songs of their artists. There have been mergers between these sites of the different publishers, as a result the sites offer music from almost all the major record companies.

The most crucial problem that music industry has to face nowadays in connection with online music business is issues like copyright and protection. Although it seems that the record companies have found a solution since they started to get more and more involved in online music business.

According to a research done by Forrester Research[1] the online music business has a potential to become a $ 3 billion business by 2008. This prognosis is backed up by the most recent data from the online music

[1] Unfortunately we were not able to access the whole research

providers iTunes and AOL. iTunes last year had revenues of about $ 670 million [1] from music downloads by Internet users. Meanwhile AOL reported 18 million music listeners a month on their sites.

On the other hand as Internet became the part of everyday life it provided a huge possibility for those musicians who have not had the chance to reach a wider audience. With the help of the new media it was easy to get reviewed by others, or to obtain new fans in the other parts of the world. As a result a blossoming of new alternative / demo bands can be observed. Usually the alternative / demo bands are unsigned therefore they do not have to face copyright issues at the moment when their music is downloaded from the Internet, as a result at the beginning legal issues are not so stressful.

It has to be emphasized that usually around musicians and bands a very lively and vivid community life evolves. The fans establish clubs or teams and organize activities for themselves. As Internet became a part of the everyday life maintaining and "managing" a community is easier. One can reach lots of people at the same time, there is the possibility of instant messaging and also organizing both online and offline activities are simplified.

In this document it was not in our intention to get involved in the debate over P2P services in legal terms therefore we are not dealing with this issue. Against common understanding all the content shared with these systems is not illegal. Also analyzing the business strategies of the mainstream record companies would have offered an interesting topic; however we think that there more untapped business potential in alternative/demo music.

The higher bandwidth and the more enhanced mobile terminals make it possible to find several new community activities or business perspectives, however to analyze these possibilities are also out of the scope of this document.

For this study we went through significant amount of web sites to understand the logic behind alternative / demo music communities. Most of the sites reviewed are international, but some major Finnish sites are also presented because of their familiarity to authors.

It should be pointed out that business opportunities, legal concerns and bottlenecks are different here than in mainstream music business. We also have also participated in communities and street teams to get practical point of view.

In Chapter 2 we are giving short analysis from the point of view of community and business perspectives on the grounds of our categorization of some communities we found on the Internet. In Chapter 3 we give some thoughts how the business possibilities could be utilized more efficiently combined with new ideas. And finally in Chapter 4 a summary is done and the conclusion is drawn.

2 Analyses of current communities & business opportunities

As mentioned in the previous chapter, there are a growing number of community web sites that unsigned artists can post their music to be downloaded and reviewed. These web sites are mostly unprofitable and run by music enthusiasts, but there can be also found web sites that are aiming for profitable long-term business. Business models vary significantly from site to site, but most common way of funding the operational costs of the site is advertising e.g. banner or pop-up advertisements.

Communities can be divided in different categories according to where the main parts of community activities happen. Communities could be also divided according to business logic that lies behind them. The problem with this categorization would be that most of the communities have multiple revenue sources. Usually it is advertising and one or more other ways of earning money. Therefore we decided to deploy the former categorization. However it should be emphasized that there are no strict boundaries between the categories. As a result a community might fit to multiple categories. In this study we divided the communities into the most suitable categories.

Three main categories on the basis of where activities happen are:

- online activity oriented
- offline activity oriented
- combined

Offline activity oriented communities are out of the scope of this study. We just present ideas what can be considered as an offline activity oriented community according to our categorization. Our findings are summarized in chapter 2.4.

2.1 Online activity oriented

On these web sites most community activities happen online. Our purpose was to gather different kind of web sites with different functionalities and business logic. As mentioned before P2P communities are left out of this study.

2.1.1 Internet Underground Music Archive

http://www.iuma.com/

Internet Underground Music Archive (IUMA) was the first web site to offer unsigned musicians a possibility to promote and sell their music in the Internet. Today the site offers services like posted music reviews and web space services for bands. Bands can set up their home pages informing about the band, sell MP3s and CDs, create message boards and lists and get email addresses for free.

According to IUMA's strategy they will continue providing services to bands free of charge. They also think that limiting access to their unsigned music archives for example by introducing some fees is a solution. Therefore they have introduced a sponsorship program to finance site operations. In practice this program means advertisements on the site. The site is so big that running it requires substantial amount of personnel and that's why this kind of site would extremely challenging to run using only volunteer work.

IUMA is part of Vitaminic network which includes also emerging music web site and artist community Peoplesound.com, French online music web site FraceMp3 and publishing company ZipMind. The catalogue of Vitaminic network contains more than 400 000 digital tracks which are organized into over 250 genres coming from more than 91 000 artists. This figure includes also signed music from over 1 400 record labels including established players like BMG, Emi, Sony, Universal and Warner. They have also formed partnerships with some companies like musical equipment providers, but at the moment web site does not give a clear picture about the issue. [4]

2.1.2 Muusikoiden.net

http://muusikoiden.net/

Muusikoiden.net is a web service in Finnish aimed for music professionals, amateurs as well as music consumers. The aim is to create a meeting point for music enthusiasts and provide services to them. Muusikoiden.net has been funded so far with owner's money, advertisements and donations. The web site has won Golden Pixel award at The Big One multimedia contest in best non-commercial web service in 2003. Also Turku's nuorisoasiankeskus has awarded the web site with music promotion award because of their contribution promoting unsigned bands and musical culture.

Muusikoiden.net provides discussion forums, interviews of artists, possibility to post wanted advertisements to find new band members, marketplace for used musical equipment, gig calendar for demo bands and some articles and FAQs about music making. They also provide a "demo studio" service where demo band can post their links to their music and others can give feedback from it.

Muusikoiden.net is the biggest and most active web community in Finnish language in this domain. Members of the community have also organized lots of offline activities on their on such as meetings, jamming camps and ordering web site membership t-shirts. Also there's Muusikoiden.net Operation: Live of which purpose is to support unsigned bands and arrange gigs for them.

2.1.3 Radio Wazee

http://www.wazee.org/

Radio Wazee is a web-only modern alternative rock station. It receives its music from the very same sources as traditional radio stations. This means that they have an instant access to music libraries long before music is available at record stores or anywhere online. Normally it takes 4-8 weeks for new releases until they get air play on commercial radio stations. Radio Wazee plays those instantly. So far the station is financed by donations and advertisements on the web site, but there are no audio commercials on air. Radio channel's web site also provides chance to post demo songs for unsigned artists and get feedback from them. The best ranked songs got a change to be played on Radio Wazee's broadcast.

In many countries public and commercial radio stations are focused more on main stream music and this why services like Radio Wazee are needed. The service gathers together people who are interested in modern alternative rock music and gives these enthusiasts a change to discuss about the music they love. Radio Wazee's slogan "We are building a religion" clearly points out how passionate their listeners are

towards music. As a community building elements on the web site can be seen forum, demo music download and review and possibility to send listener's picture to the site for everyone to view.

2.1.4 ACIDPlanet

http://www.acidplanet.com/

ACIDPlanet is a very interesting and unique community among the online activities sites. This web page is organized around the software family called ACID®. However this software is not the only one to create music with but most of the members use ACID®, for other software there are other sites.

The main idea behind this site is very simple the members can review each other's songs if they are registered, whilst the music fans can listen to the different tracks available.

In the different chat channels and forums the members can get and learn useful hints and tricks to explore the possibilities within the software.

In case of this site the business aspect is very important too hence the producer of the software promotes its other products to the users to make more professional recordings. There are also contests organized by the owners of the site to encourage the members to do their song or to mix songs that already exist.

As said before in case of this site the business aspects are also emphasized but the community also forms an essential part of the site's concept. The relation with the community members is very important for the owner since this is not just a "simple" relation as it is between the producer and the customer. As a result the community has a helpdesk function.

2.1.5 Mesta.net: mestamp3

http://www.mesta.net/mestamp3/

Mesta.net is typical example of a mainstream music news web site that provides also possibility to post demo songs in MP3 format. Although some news and interviews about demo level bands is provided, there's no real community creation in this one. The site is part of Internet, telecommunications and mobile entertainment company Saunalahti Group Oyj.

2.1.6 Garageband

http://www.garageband.com/

Garageband.com is in a way formed to the ashes of former giant MP3.com. For example musicians can automatically transfer their music and other content to GarageBand.com.

Garageband is having a close partnership with music licensing company Trusonic.

This partnership gives them access to Trusonic's database of which includes their part of the songs and content that was once available at MP3.com. Trusonic focuses on providing music to its business and retail clients. Top artists of GarageBand.com can get in-store play and gain royalty payments because of this Truesonic partnership.

The mission of GarageBand.com is to "empower musicians and discover the best independent music". [9] Their long term purpose is to change the way music is discovered and promoted. The purpose of their model is to give customer's more musical variety at lower costs and let musicians retain more control of their products and careers.

Their management team consists of semi-experienced professionals. In addition they have an advisory board consisting of 37 members chaired by five time Grammy award winner Sir George Martin.

The site offers a range of free and paid services to musicians. Review services of demo songs, gig promotion and advices from industry experts. They also have a patent-pending review process for the music sent to their site.

2.1.7 Bandit

http://www.bandirekisteri.fi/

Bandit is an informal register for musical acts that are from Finland or have a Finnish name. Bands can check if the wanted name is already taken and if not they can register the name for them. The site also provides gig calendar, forum for posting advertisements for demo band CDs, marketplace for used

equipment, chance to search bands for gig organizers as well a chance for bands to search for band members. Bandit is financed with advertisements.

2.1.8 Unsigned Music Review

http://www.unsignedmusicreview.com/

This site is dedicated for those artists and bands who would like to get a review on the music they have managed to compose. According to the site's introduction the maintainers of the site offer the bands a possibility to have their compositions reviewed by professionals from the music industry.

The main concept behind the site is musicians send their demo tapes or recordings to the owner of the site who will deliver the received tracks to some music industry expert who listen to the music and give their reviews. The intention of Unsigned Music Reviews (UMR) is to provide a forum for the newcomer artists to get a review from a professional critic, since it can be very difficult to get in touch with people from the music industry.

It has to emphasized, that this service is not for free. The musicians have to pay certain amount of money to get reviewed. The more the artist pays the better service he gets. As a result this site should be considered as a business opportunity for the owners of the site. Although method does not give any assurance to the artist that their compositions are reviewed by a professional, since there is no indication of the critic.

The business model used does not back up involving internet users into the reviewing of songs of different artists, therefore there is no way to form a community around the site.

The maker of this site have had bigger plans since they wanted to take a step further not just giving feedback to the artists, but it was planned to publish a magazine for the wider public. According to the UMR publishing a CD was also among the plans. The CD would have contained the songs that got the best reviews. This would have been a unique possibility for the newcomer bands that could have had chance to merchandize their songs on a CD with the help of the Internet.

The usage of past tense is unfortunately needed, thus it seems that this site has been out of use quite a long time ago and none of the bigger plans of publishing a magazine or a CD succeeded.

All in all Unsigned Music Review offered musicians and bands a chance to get feedback from professionals of the music industry. The business idea was to make the artists pay for getting a review. It seems that the site was quite successful for a time, since new plans emerged on publishing a magazine and a CD. However the site did not make it maybe due to the high fees or the lack of reputation in the music business. Although the business model offers an interesting possibility to merchandise unsigned music.

2.1.9 CTGmusic.com

http://www.ctgmusic.com/

The CTG Music Community is a great example of the on-line type activity music sites, especially for those artists and bands who would like to get their songs and tracks reviewed. This site has duel purpose on the one hand the musicians can get feedback; on the other hand it provides a forum for the people who review the music.

To enter the site no registration is needed so everybody who is interested in the music can search the archives for the music of her/his taste. The CTS Music Community web site also offers lots of possibilities to find the music wanted. There are different charts that hold up the best songs or the top artist etc.

For those who would like to participate in the community with either sending songs or giving reviews for the others registration is needed. As the registration is done the member is authorized to participate in the life of the community.

In case of this site the business approach is not that important since there are not many advertisements on the site and there is no other business activity related to the site, like selling certain items.

Although this site has an interesting feature as it has its own "web radio" that plays the music sent for reviews. The "web radio" is a simple play list that makes it possible to listen to the songs on the site, but still it is a unique feature.

In our opinion this site is rather run by enthusiastic amateurs not by professionals who would try to get profit as soon as possible. This site is more organized around the community itself then any business consideration.

2.1.10 InterConnected Music Media

http://www.ic-musicmedia.com/

The InterConnected Music Media site is a real professional web page, where the makers have a very clear business concept. The key concept is similar to most of the ideas of online sites as the musicians and artists can send their songs and then get a review. Although the reviews are not only can be done by the members of the site but anyone interested can give a feedback to the artist.

This way of organizing makes it easier to get reviews since there is no need for registration therefore a wider range of public can participate in reviewing. Thus this concept provides forums not only for musicians but any person interested.

Not only song but videos can be found at the page and it is possible to browse charts of the most popular songs or artists.

The business side of the web page is also very interesting. At the moment there are no advertisements (banners or pop-ups) on the site, therefore they try to make money in other ways. The maintainer's idea is to provide different web services for the bands for which certain fees – usually not too high – should be paid. The most popular web service is to host the musicians or bands web pages or to give the artist some technical backup to be able to maintain their web sites.

This business and community idea provides probably a very viable and successful site that offers different services to the community members as to the artists as well.

2.2 Offline activity oriented

Traditionally the community activities were mainly offline as the communities were organized around e.g. band coalitions, magazines or music clubs. However those days have passed when the life of a community could have been organized without the help of the Internet, therefore it is not easy nowadays to find a pure offline oriented music community of significant size.

Unsigned music was traditionally sold by the bands themselves or some helpful music stores. Bands sent so called demos (tapes, CDs, MDs etc.) to record companies, radio stations and magazines hoping that somebody would notice their existence and get them finally signed to some major record label. Acts received feedback or some kind of hints occasionally from record companies if they bothered and had the time to respond. Some magazines and radio stations reviewed and still review demo music. The problem is that especially nowadays when home music making and recording is relative easy, the amount of music made and sent to these parties is massive. It takes huge amount of time and effort to go through all this music and search for the best ones.

Communication between bands happened around musical events or some other meeting points, but of course it was not possible to manage as big communities as nowadays modern technology enables to manage.

Posters and newsletters did the same as band web pages and gig calendars do nowadays. Naturally posters are still used in parallel to more modern ways to promote live gigs.

Already before the Internet facilities there have been supportive teams for bands consisting of band member relatives and friends and number of fans of the band that want assist the band on the way to success.

Established radio and music TV channels, magazines and informal networks are still very central points of musical world and record companies play major role when the bands are breaking through to mainstream. But when it comes to demo or alternative music, there's not much space in the mass media for them. That's why this is probably the segment, that gains most from new ways of communication, networking and forming communities.

2.3 Combined

The most typical examples of communities that powerfully operate in the Internet and offline are street team web sites. The purpose of the street team sites is to form a community to promote a band that is featured on the site. Activities of the street team may happen either online or offline.

2.3.1 Urbanited

http://www.urbanited.com/

Urbanited is a web site of Eastborder Promotion & Management Inc. Its purpose is to form a community of street team members to promote certain artists that are clients of Urbanited. So the business logic is that record labels pay for promotion services to Urbanited. Street teamers earn credits when they report what they have done for the artist and they can use these points in return for CDs, tickets, t-shirts or other promotional material. Street team membership also provides online and offline social contacts to like-minded people. Urbanited is focusing in Europe even though welcomes people around to world to promote bands in their band repertoire.

Street teams available on this site are divided to two categories. First one, "In the garage" is for more established acts from Finland and around the world. Second category, "Urbanited feature" is for more underground bands that are waiting for their break-through.

2.3.2 I-Squad

http://i-squad.com/

I-SQUAD is a great example for the so called street team sites type where both online and offline activity is needed or encouraged. I-SQUAD offers a great variety of well or less known artist to join their "support team". The style of the artists also changes a lot from soul to pop or country.

The users can join any of the teams, there is a limit of 10 teams that a person can join, and if this limit has been reached then one of the existing memberships should be cancelled as a one wants to join a new team.

On the main page of the site the latest information or events can be found in connection with the artists who have a team on I-SQUAD. From the main page every team's site can be accessed, however only this way only some general information can be obtained. The different sites of the teams mostly offer similar possibilities to their members; as a result the sites are standardized in a way.

The main purpose of the team sites is to gather fans and organize their actions in favour of the artist. Usually there are a lot of activities both on- and offline from which the fan can choose to participate in. The members of the fan teams organized around an artist can earn certain amounts of points by participating in different kinds of activities. The collected points are counted on separate accounts; the points can not be transferred between the different accounts, in addition when a team is cancelled the points gathered are lost.

The on-line activities are usually are in connection with voting, filling questionnaires or sending requests for a song of the artist to be played on a music channel or radio. The team site also provides a possibility to chat with the other members of the group or to discuss topics in forums. The questionnaires are usually in connection with promotion of a certain product. Points also can be earned by checking out the team's site and messages regularly. Another way of the online activity is to place some banners on the web pages maintained or owned by a member.

The offline activities are generally organizing parties or meetings with other people. Also recruiting new members to the team is highly appreciated. The points for the offline activities can be received by delivering some evidence of the event organized.

Also competitions are organized among the members for some prizes for the winners. The points earned can be spent at the shop for some posters or other things related to the artists.

For the first sight the business aspect is not so strong on this page since members do not have to pay to participate, or the items from the store are not for sale. However these kind of street teams can become powerful tool in the hands of record companies. The members of a fan team can promote the artist or the band in their environment which can prove to be more sufficient then to spend huge amounts on advertising or so. The members of the fan team are really committed to the artist; they are "fanatics" in a good way. This kind of promotion for the record companies has some other advantages as well. First of all they should not spend lots of money to maintain the fan club of a musician, since the members can look after their site quite easily. And on the other hand record companies can reach the fans easily for different purposes.

In this kind of fan teams the community is more important since these sites offer a forum for the people with common interest, to share and to discuss their experiences with others.

2.4 Summary

Table 1 represents summary of the functionalities that the studied web sites provide. The most common functionalities are free music download services, discussion boards and demo music posting and reviewing services.

Table 1. Summary of the functionalities of the web sites

	Free music dowloads	Selling online / offline music	Discussion board(s)	Post a demo & get reviewed	Band home page hosting etc.	Gig calendar & promotion	Radio	Editorial content	Band member recruitment	Marketplace for used musica equipments	Articles on music making	Chat channel(s)	Helpdesk for a product	Street team
Internet Underground Music Archive	x	x	x	x	x		x	x	x					
Muusikoiden.net	x		x	x		x	o				x	x		
Radio Wazee	x		x	x			x					x		
ACIDPlanet	x		x	x								x	x	
Mesta.net: mestamp3	x		x	x				x						
Garageband	x	x	x	x	x	x	x	x			x			
Bandit		x				x			x	x				
Unsiged Music Review				x										
CTGmusic.com	x		x	x			x	o				x		
InterConnected Music Media	x		x	x	x									
Urbanited			x			x								x
I-Squad			x			x						x		x

x = functionality available | o = functionality available occasionally

Table 2 shows revenue sources that these web sites have. It should be emphasized, that sometimes it's really hard to know without seeing the contracts which way money flows between the partners. As can be seen advertising is the most common source of financing and almost always the only substantial one. From the table it is easy to notice how few opportunities that partnership programs could provide are actually used.

Table 2. Summary of the revenue sources of the web sites

	Advertising	Music sales to consumers	Consulting services (professional advices etc)	Promoting & marketing artists	Digital artist agency business (booking artists etc.)	Web hosting & services	Partnership royalties and fees from: (excluding pure advertising)				
							music licensing agencies	musical equipment stores	artist agency & promotion companies	CD pressing companies	established record lables
Internet Underground Music Archive	x						x	x		x	x
Muusikoiden.net	x										
Radio Wazee	x										
ACIDPlanet	x							x			
Mesta.net: mestamp3	x										
Garageband	x	x					x	x	x	x	
Bandit	x										
Unsiged Music Review	x		x								
CTGmusic.com	x										
InterConnected Music Media				x		x					
Urbanited	x								x		x
I-Squad									x		x

x = revenue source

3 Ideas

As it can be observed in Table 2 there is only a few business activities around the alternative/demo music oriented sites nowadays, although there may be a huge business potential, since there are several communities around these bands that can be considered as market force.

Usually on the Internet revenues are mostly based on the advertisements placed on a web page. The more popular a site is, the more advertisements can be situated on the page, and therefore it is really important for the owners of a site to have a big community around.

The most common way to obtain money from these types of sites is to use some kind of advertisements on the page like banners or pop-ups. However some sites started to offer different kind of commercialized services for musicians and bands. These services are usually in an inchoative stage but they are able to produce some reassuring results.

It seems that the most successful service is web page hosting and services that help to promote bands via the Internet. The promotion can be placing banners to other websites or merchandising songs of the artist. Although it is quite clear that nowadays there is not enough demand for these kinds of services from the side of the artists.

In our point of view this solution can become more popular in the oncoming years. Though there should be some other resources of revenues if the owners would like to make their web site more profitable.

It can be stated that a real profitable business should not be one-sided when talking about its sources of revenues. Somehow it has to achieved, that the sites dispose multiple types of revenues.

One possibility might be building strategic relationships with organizations that could help the development of the demo/alternative bands. For example an alliance with a Digital Artist Agency could help the bands to progress with their marketing or merchandising tasks. A relation like that would be advantageous for both parties; since promoting and marketing artist is a very complex task therefore experts in this area can be useful. This kind of DAA would be ideal to do some consulting and to give professional advices needed to the artists. When talking about a relationship we are not thinking of placing a simple advertisement on the site but a holistic service offered by a site for the artists.

The digital artist agency model provides win-win relationship between DAA and artists. Traditionally artist agencies' share of the revenues that their artist earns is about 15-20% [1]. Even the same percentage can not probably be maintained with digital artist agency business it would be very profitable business for DAA because of low maintenance costs. Artists would gain in a form of smaller amount parties eating their part of cake and they are likely to have lower agency fees.

Another possibility would be to have partnership with record publishing companies or established record labels. This would be also very beneficial for each of the three parties. On the one hand side the site maintainers could receive money from record publishers so they can improve their services. On the other hand the record labels can recruit new bands for their "team" and hence there are communities around these sites and bands they can obtain a real good survey on the people who are fond of that kind of music. A partnership like this also favours the bands since it would become easier to enter the music scene. Meanwhile digital distribution of music makes established record companies and delivery network not necessary. This makes interest of the alternative / demo music sites and record companies conflicting. The sites could sell music directly dropping record companies out of the value chain. This questions roles of record companies as we know them today.

At the moment we do not think that it would be a winning idea to introduce fees for the community members around this site since it could happen easily that these people would wander to another site providing similar services. We think that the biggest value concerning these sites lies within the community organized around them. Therefore certain free services in favour of the communities have to be maintained thus the web pages can preserve their popularity among the Internet users.

Also the big and established record companies and labels have other possibilities on their hands. As at the moment these labels have the market power and money the act to preserve their leading position in the music industry. A solution for the music industry giants would be to buy a share in one of the established alternative /demo music site thus the company could save reasonable money as there is no need to create a site and a community which can be really hard task. As the record label has access to one of the more established site it can use it as a new media to promote their artist. Although the big labels should be aware not to make very obvious their presence on a certain site since the bands can loose their alternative touch in the eyes of their community. As the result of having a share in a site allows the labels to have more

direct access to the members of the community so a perfect feedback forum can be established to help the marketing process at the companies. Also the communities can be used for recruitment of new talented artists that are able to enter the music scene.

The members of the community are currently rating music posted on the web site, but results of this rating or filtering process are not fully exploited (at least according to publicly available information). For sure talent agents of record companies go through the best rated bands of these sites, but still a deeper relationship would be beneficial to both parties. All the record labels need huge resources to go through piles of demo recordings that they have receive and still it's really hard to draw conclusions what act might success. Creating a community rating system that supports at the same time artist selection process as well interest of community members as well as bands would be worth of a lot.

4 Conclusions and discussion

In this document we have tried to give a short overview of the Internet based music industry from its roots until the present state. As it was presented the online music business does not look back to a long history therefore the more experience is gathered the more successful a business can be.

Currently it seems that one of the most important problems that set back the rapid development of the online music industry is being solved as the debate over legal issues concerning copyrights reach the end. As a result recently the major record publishers and labels started to participate in the online music market that at first was considered as a threat to their business.

As for the demo/alternative musicians Internet provided a new horizon. The appearance of this novel media created a more vivid community life and more possibilities to reach people that are interested in the music that these artists compose. At the moment different kinds of web pages can be found on the Internet, and several kind of categorization can be done. In this document we have chosen for the basis of our categorization the relation between the site and the activities of the communities. We also tried to give a short analysis of every site mentioned from the point of view of communities as wall as business aspects.

As a result of the analysis we have drawn the inference that the sites found are not using all the business opportunities they may have thus we came up with some possibilities that could be successful. In our point of you still the alternative / demo music industry has great opportunities; it can be a big success. However the sites and the business found have to get multiple sources of revenues involved. Also it is important to build or to strengthen the existing relations in the direction of the established industry actors like big labels. Moreover the maintainers of these sites have to offer more integrated services toward both the bands that are using the site and the individual user or communities in order to have stronger devotion which can be proved very important when building a successful and profitable business. Last but not least taking care, organizing and maintaining the community around a site is a really demanding task therefore huge efforts should be made in order to have a vivid community life which results in higher number of visitors on a certain page and having a positive effect on the revenues gained.

This topic offers lots of possibilities to conclude research either concentrating on the communities and their activities either the business aspects of the online music industry. We are convinced that these researches would be rewarding since it is enough to refer to the research done by Forrester Research saying the online music business would develop into a $ 3 billion business by 2008.

5 Glossary

Alternative music in this document is considered as all the music that is not mainstream music. Mainstream music is that part of music that gains huge airplays and sells worth of millions of dollars.

Street team is a group of individuals who are willing to spread the word out on bands and music in grass root level by word of mouth and using promo materials (stickers, samplers, posters, etc.). Utilizing these materials and putting them in places such as record stores, live shows, shopping malls, schools, streets, skate parks…wherever you think you can get people interested in the bands. [14]

Unsigned band/artist in this document means band or artist that has not yet signed contract with a major record label. Immaterial rights of these bands are not controlled by organizations like RIAA or Teosto ry.

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Virtual Communities and Peer-to-Peer File-Sharing Networks

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Abstract

This paper discusses the relationship between virtual communities and Peer-to-Peer (P2P) file-sharing networks. Current state of P2P file-sharing networks and business opportunities that they offer are presented. Next, the concept of virtual communities is explained, as well as the value they create for the web-based businesses. Then, current state of virtual communities in P2P file-sharing networks is presented on the example of eDonkey2K network. The analysis focuses on the eMule client and its features supporting development of virtual communities within the P2P file sharing network. Types of virtual communities existing within the network are described and their value for the network is explained. Finally, some ideas for the further development are presented.

1 Introduction

1.1 Background

Since the launch of Napster music service in 1999, peer-to-peer (P2P) file-sharing has gained significant attention in media, business world and amongst academic researchers worldwide. Networks of users built around the technology have steeply grown in numbers. Currently there are more than 10 popular P2P networks (e.g. FastTrack, Direct Connect, eDonkey2K, WinMX, MP2P, or Gnutella) and more than 25 software clients (e.g. Kazaa, Bearshare, eMule, Morpheus, Grokster). According to IFPI Online Music Report the number of simultaneous users (logged on at any one time) of P2P file-sharing services increased from 3 million in June 2002 to 6.2 million as of January 2004. There are around 800 million files available in these services according to June 2004 issue of *Wired Magazine* and just in the first quarter of 2004 the data traffic exceeded 8,000 terabytes.

The main reason for joining P2P file-sharing networks is exchange of music and video files, but also images, software, or electronic books (ebooks), an activity which is legal only in Canada and for which thousands of people have been prosecuted in Europe and United States. Hence, despite the fact that peer-to-peer file-sharing offers great opportunities for innovative business models, majority of the firms operating on the market concentrate on selling applications or generating revenues from advertising in the network. However, the situation is changing now. Several companies try to take advantage of the possibilities P2P file-sharing gives to create novel revenue models. Wippit utilizes P2P file-sharing network in order to sell music files. The company offers song downloads within the network on a per-track basis, or unlimited downloads for a yearly subscription fee. The company uses Cantametrix MusicDNA technology in order to recognize the content and ensure that only approved material is swapped. Altnet has signed distribution deals with more than 70 independent labels to distribute their materials over the most popular P2P files-sharing network, FastTrack. Two companies, Xtray and Qpeer, aim to open similar services in second half 2004. However, these firms will offer the service for free and plan to cover the costs of royalties' from advertising. Another firm, Mercora, offers their P2P file-sharing client for exchange of pictures and direct communication, a service aimed at dispersed families, groups of friends or virtual communities of interest. However, the most innovative function of Mercora is the ability to broadcast the playlist over the network. Although service does not enable illegal music files swapping, users can listen to each other playlists in a same fashion as they would listen to Internet radios. There are also many other companies considering the use of P2P file-sharing in the wireless, Internet, where bandwidth and storage capacities are still very limited and expensive.

1.2 Motivation

P2P file-sharing offers a powerful model for distribution of digital information goods. It enables firms to push the storage and bandwidth costs onto their customers, as they provide them (Estier and Rupp, 2003). As Vassileva (2002) points out, it is also considered "invincible" because of the decentralization of control, and "unbeatable" because of the outstanding performances it can offer and because it is enthusiastically supported by its participants. However, firms deciding to build a business model around this distribution

form must first find a way to convince users to join the network and stay within it also at the time when they are not actively benefiting from the network. In addition, such companies need to face two major problems, namely free riding and control. First, a company needs to convince users not only to consume the content available within the network, but also to, dedicate storage space for shared files and free bandwidth for uploading or even to provide own content. It is also important to ensure that within the network users will distribute only the content that is approved by the company and only in the form that is aligned with the company business goals.

Most of the companies operating P2P file-sharing try to solve these problems with technical solutions installed in software clients. However, these solutions very often do not provide satisfactory results or create dissatisfaction among users. This paper proposes different approach for solving abovementioned issues. It focuses on the sociological aspects of human behavior in virtual communities and discusses potential ways of improving the performance of P2P file-sharing networks through the creation of a stronger community feeling among its users.

1.3 Research problem and scope of the paper

The paper focuses on Peer-to-Peer file-sharing networks and potential positive impact of virtual communities on such networks. The research question that the paper aims to answer can be formulated as follows:

How firms can improve the quality of P2P file-sharing networks by supporting formation and functioning of virtual communities of file sharers?

In more detail, the paper gives answers to the following questions. How can a firm improve adoption of the service among the potential users by supporting the emergence of virtual communities among file traders? How can virtual communities extend the time users spend connected to the P2P file-sharing network, whether they are participating actively (downloading files from the network) or passively (not downloading files, but sharing files and bandwidth with other users)? Can virtual communities positively influence users willingness to dedicate own time and resources to create common value for all such networks? Can virtual communities encourage users to behave according to the rules set for the network and control the behavior of other users?

The paper has four main objectives. (1) Explain current state of P2P file-sharing networks. (2) Describe characteristics of virtual communities and their potential for influencing users' behavior on the Internet. Identify these characteristics, which can be useful in supporting P2P file-sharing networks. (3) Analyze the current state of virtual communities in such networks on the basis of eDonkey2K system. (4) Give recommendations for companies that have business models utilizing file-sharing networks.

1.4 Structure of the paper

This paper is divided into five parts. After the introductory section P2P file-sharing networks are presented in detail. Their current state and future opportunities are discussed, in particular the motivation for people to join such networks, the operational models and internal structures. The section finishes with discussion over two main problems hindering the development of P2P file-sharing networks, the problem of free riding, or more general, issue of motivating users to voluntarily contribute to the network, and the problem of control over users' behavior, especially over the files they release to the network.

The following section presents an overview of virtual communities. In this part it is explained what virtual communities are and what are their general characteristics. Most popular types of virtual communities are shortly described.

The fourth section starts with presenting current state of virtual communities within P2P file-sharing networks. It is discussed what positive impact virtual communities can have on such networks. Then advanced P2P file-sharing client is presented and features supporting the development of P2P file-sharing network are described. Then it is discussed whether P2P file-sharing user groups can be considered a large community. Virtual communities existing within the network are presented. Finally, ideas for developing new and strengthening already existing communities are presented

The last section discusses main ideas of the paper and makes propositions for further research.

2 Peer-to-Peer file-sharing networks

2.1 Introduction

Academic literature proposes several definitions for peer-to-peer networks. Foster and Iamnitchi (2003) define these networks as "decentralized, self-organizing distributed systems, in which all or most communication is symmetric". More comprehensive definition is proposed by Khambatti (2004b). "Peer to Peer (P2P) systems are distributed systems in which logically distinct computing elements called peers, having comparable roles and responsibilities, communicate information, share or consume services and resources amongst each other. These systems have the potential to harness massive amounts of storage with modest investment and no central authority." The P2P file-sharing, which is the central point of this paper, refers to particular type of file-sharing architecture used by several companies. Typically, the system consists of a series of centralized servers, or users' client software that also act as servers that route requests for files and direct electronic traffic. Users (peers) run on their own computers software clients that connect to these central servers. Servers are used to facilitate searching of the files within the peers' network. However, transactions – particular transfers of files – are done directly between users' computers and after searching is completed users do not need to be connected anymore to central servers. The key is to allow users to access and provision information guarantying at the same time level of anonymity that is not possible in the present client-server architecture of the Web. The most popular P2P file-sharing networks are presented in table 1.

Table 1. Most popular P2P networks (source: *www.slyck.com*, 26 June 2004)

Network	Clients	No. of simultaneous users
FastTrack	Grokster, Kazaa, Kazaa Lite, new iMesh	2,479,381
eDonkey2K	eDonkey, eMule, mlDonkey	2,028,975
Overnet	Overnet	1,032,192
iMesh	Original iMesh	829,911
Gnutella	BearShare, Gnucleus, LimeWare, Morpheus, Shareaza, XoloX,	337,857
MP2P	Blubster, Piolet, RockitNet	260,829

There are three basic models of P2P file-sharing networks: (1) *centralized* (e.g. Napster), (2) *decentralized* (e.g. Gnutella, Freenet), (3) *controlled – decentralized* (e.g. Kazaa, Groove). Centralized and decentralized models are described in Appendix 1. The third model is a combination of first two.

2.2 Revenue potential for P2P file-sharing networks

P2P file-sharing networks emerged as systems that facilitate search and exchange of files between people on the Internet. Basic business models created around P2P file-sharing focused on providing users a service that enabled them to find one another on the Web, contact and exchange files in the most convenient fashion. Firms made their revenues either by charging for the service itself (subscription based), for the software that enabled exchange (one time fee to join the network), or by providing marketing services (e.g. sell advertising space inside the software clients used by peers, or track user behavior on the web and sell marketing information to other companies).

Recently many companies realized that the P2P file-sharing offers many other opportunities for revenue generation. As Estier and Rupp (2003) point out, P2P file-sharing networks offer an enormous opportunity as a distribution channel for companies offering digital information goods. While minimizing the costs of running the distribution (storage and bandwidth costs are pushed to the customers), P2P file-sharing networks exhibit strong positive network externalities enabling companies to easily access large amount of potential customers. Moreover, because these networks are enthusiastically supported by their participants (Vassileva, 2002), companies that offer their products through such networks get much bigger support from the customers than their counterparts using more traditional distribution systems. This creates large market space for products distributed in the form of *Superdistribution.*

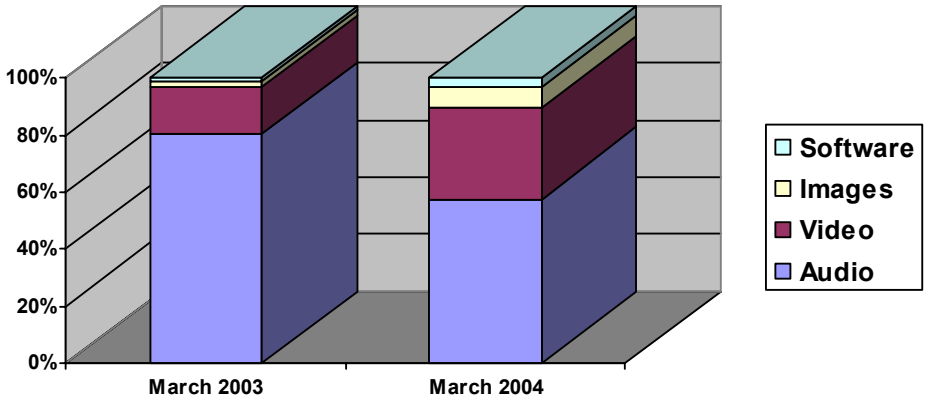

Figure 1. Structure of traffic in P2P network (source: *Wired*, June 2004)

Currently, two most popular types of content exchanged in file-sharing networks are music and videos (see figure 1 for details). This type of distribution can be especially effective for less renowned artists. An example of underground DJ Danger Mouse shows the potential for the network. Los Angeles based Danger Mouse was not known to larger public before he mixed Jay-Z *Black Album* and Beatles *White Album* to create his *Grey Album*. Although his work was never officially published in April 2004, just within four months since the release of the record, according to June 2004 issue of *Wired Magazine,* it peaked 1.25 million downloads in P2P file-sharing networks making him one of more popular DJs. Similarly, emerging punk group Alkaline Trio was able to more than double its fan base, thanks to the leak of material to P2P networks, according to Dan Gill, general manager of Vagrant Records, the publisher of the album. Wippit, Altnet, Xtray and Qpeer are one of the first that saw this large opportunity space and decided to build their business models around it.

2.3 Internal structure of P2P file-sharing networks

For any company planning to build a business model around P2P file-sharing it is essential to understand why people join such networks, how such networks function and what the reasons are for people to leave the networks.

It is often perceived that the opportunity to get content for free is the main factor driving people to P2P file-sharing. However, consumer studies conducted by IDC and Forrester Research show that for majority of users, the main driving factors are a breadth of content available, the simplicity of search and discovery of new content and the convenience of obtaining that content (instantaneous download). The price difference (i.e. the opportunity to obtain content for free) was a secondary factor, mentioned by less than one-third of the respondents.

It is important to emphasize that all the abovementioned factors are dependent on users of the networks. The users are the ones who bring new content to P2P file-sharing networks, thus increasing the breadth of content available. The other users can support search and discovery for example by enabling others to browse through their shared files folders, or by reviewing movies and albums. They finally affect the convenience of downloading new content by sharing the files and dedicating own bandwidth for others to use to download files. As Vassileva (2002) argues, the most important prerequisite for the success of any peer-to-peer file-sharing network is the willingness of the participants to provide resources (i.e. files, computational cycles, bandwidth, own time and effort) to others.

The reasons for people to leave file-sharing networks can be divided into two groups. According to Jupiter Research and Forrester Research, many of users who decided not to participate in file-sharing networks, did that either because of the threat of legal action from organizations protecting copyrights, or because of moral objections to participate in 'theft' of copyrighted material. These problems are not discussed in here, as it is assumed that firms building business models around P2P file-sharing aim to distribute content without violating the copyright laws. The other reasons, which also attribute for peers decision to change network into which they are engaged are poor selection of content, low quality of content (i.e. malicious software, counterfeit files), and problems with downloading software (e.g. very long queues, low bandwidths dedicated for uploading). These problems are an outcome of particular behavior of network

users, i.e. free riding and behavior that intends on harming other network users, such as sharing software infected with viruses or releasing counterfeited files.

Table 2. Factors value of P2P file sharing networks.

#	Success factors	Positive	Negative
1.	Breadth of content	Willingness to create deliver new content to the network	Legal restrictions Free riding Harmful behavior of users
2.	Simplicity of search and discovery	Willingness to dedicate time and effort to facilitate searches or others (e.g. create hash links to verified files)	Free riding Harmful behavior of users
3.	Convenience of obtaining content	Willingness to dedicate bandwidth and storage space	Free riding Harmful behavior of users

Peer to peer systems differ to traditional distributed systems, as in P2P administration of each node is under individual control, and goals of individual participants are not the same as the goals of the overall system. Users can be divided into different groups basing on the character of their behavior within the network. Vassileva (2002) identifies five levels of user cooperative participation in a P2P system. They are presented with a decreasing level of user involvement:

1. **Create service** – users creating new resources and services and offering them to the community. Typically this level also includes *allow service* and *facilitate search* levels.
2. **Allow service** – users provide their disk space to store files for downloads and bandwidth capacity to support distribution of files released by other network users.
3. **Facilitate search** – users providing a list of relationships to other users to facilitate their search of files or services.
4. **Allow communication** – users forwarding ping-pong, query and hit messages, i.e. actively participating in the protocol of the network.
5. **Uncooperative free rider** – downloading files or utilizing services when needed, but going off immediately afterwards.

It is proposed to extend this classification by the sixth group, **network destroyer**. This group includes all people whose actions are aimed at harming the network and it participants. It includes those providing counterfeits in order to reduce the level of piracy within the networks, as well as all kinds of crackers that utilize P2P file-sharing networks to distribute malicious software, i.e. viruses and Trojan Horses, or use software clients' vulnerabilities to hack into file sharers computers.

Companies that base their business models on P2P file-sharing networks must find ways to encourage people to *create service*, or at least *allow service* and *facilitate search*. On the other side it must minimize or totally eliminate from the network *uncooperative free riders* and *network destroyers*.

2.4 The free riding problem

Standard economic theory assumes that "rational, self-interested individuals will not act to achieve their common or group interests" (Olson, 1965). Hence is the supposition, that in large anonymous groups, such as P2P file-sharing networks, individuals will rationally free ride (benefit from the usage of the system, but do not contribute to the system at all) and vitiate opportunities for mutually beneficial voluntary group cooperation (Cunningham et al., 2004).

In the case of networks such as FastTrack, Gnutella or eDonkey2K a common good of the whole community is the library of shared files (measured in terms of breadth and quality) and the shared bandwidth in the system. Hence, the dilemma that each user faces is to either contribute to the common good, or to shirk and free ride on the work of others. Because, users are not charged for the use of the

service and not rewarded for their contributions, the rational individual will download files without contributing to the service.

Many academics (Alexander, 2002; Cunningham, 2004; Adar and Huberman, 2000; Vassileva, 2002; Foster and Iamnitchi, 2003; Fehr and Gahter 2000) point out free riding to be one of a biggest threats for the successful development of P2P file-sharing networks. Free riders not only fail to contribute to the network, but also decrease the total quality of the network. They use bandwidth and storage capacity of other members, thus decreasing the service quality for those members who do share their files. Moreover, in decentralized systems free riders significantly decrease the effectiveness of search queries, which are limited to the certain number of hops. Moreover, as Adar and Huberman (2000) point out, massive free riding leads to vulnerability of the system. If only few individuals share their catalogs, with time they start to act as centralized servers and thus become vulnerable to denial of service attacks and potential loss of privacy. As a result, new peers might decide to free ride and not offer their resources making the process subsequent. Hence, as Alexander (2002) points out, "the simple Nash equilibrium of a peer-to-peer network predicts a collapse of the network."

The scale of free riding problem has been shown by two studies. Adar and Huberman (2000) sampled messages on the Gnutella network over 24-hour period. The authors found that 66% of Gnutella users share no files, while 73% share ten or less files. The top 1% of sharing hosts returns 50% of all responses, the top 5% peers share altogether 70% of all files available through Gnutella network and the top 20% provide 98% of all files. In the 2003 study analyzing origins of files in the P2P file-sharing networks, US research consultancy Net PD found out that 74% of files are made available by 16% of users.

Many companies tried to resolve this problem by enforcing sharing on the network users. For example, most of Direct Connect servers require peers to share certain amount of files in order to log into them. This approach is similar to the way old BBSes used to work, where users were required to upload files before they were allowed to download any. However, peers still resist sharing valuable files and instead of contributing to the value of the network, they decrease the value by sharing files of no value for other users or even by sharing counterfeits. Other systems, such as eDonkey2K and FastTrack have their clients set by default to download files to shared folders, ensuring that at least some users will keep on sharing files which they have downloaded. In addition, eDonkey2K clients share files while they are still being downloaded. Some firms try to solve the free riding even by confusing users. Kazaa client for the FastTrack network after pressing the close button, does not close but only minimizes itself and keeps working in the background. In order to quit the application, users need to perform additional action and select "Quit" once again from the bottom menu, something that many users may not know how to do. However, all these solutions are not very effective. In addition, a company cannot aim to build a sustainable network of users on the assumption that it will confuse or enforce them to do something against their will. What a firm should do is to find ways to persuade users to voluntarily commit their resources to the network. One of the potential ways to do that is building a virtual community around the network or within the network.

2.5 The problem of harmful users' behavior

Most of the P2P file-sharing systems has architectures that guarantee users almost total anonymity. As Khambatti et al. (2004a) point out, this makes the systems "vulnerable to attack by malicious peers who could abuse the P2P system to spread viruses, incorrect, or damaging information." In addition to valuable files, users in P2P file-sharing networks share infected software, Trojan Horses that enable hacker attacks, damaged or counterfeited files or even child pornography. Hence, companies need to identify methods for encouraging users to act accordingly to the rules set for the system and they need to create a viable trust model that will allow users to have varying levels of dynamically changeable trust amongst each other. Khambatti et al. (2004a) mention four main challenges that companies need to address on this field: (1) how to describe if a peer is trustworthy, (2) what low-cost verification algorithm can be executed by a peer to determine the trust value of some other peer, (3) how are trust values about other peers exchanged within the system, (4) how can dishonest peers be punished.

Currently, typical solution to the problem is to focus on shared files, not on peers sharing them. Users can comment files providing others with information about the real content of the file. For example in the eDonkey2K network files commented positively or negatively by users are shown in the client with changed color (green or red), so the user willing to download them can immediately see if there is any problem. The other solution is so called hash links. Almost for every peer-to-peer network there are websites that support searching for "verified" files within the network. These two approaches bring P2P file-sharing networks closer to becoming communities, by encouraging users to support each other,

exchange their opinions and by that create value for the whole network. However, it is possible to utilize this sort of behavior also to rate other peers, thus bringing incentives for users to behave accordingly to the network rules. This concept is described in more details in section four of this paper.

3 Virtual communities

3.1 Introduction

In the last decade virtual communities became an often topic of academic discussions as well as popular press. Academics argue what virtual communities are and whether a grouping of people who do not know each other and do not have face-to-face conversations can be called a community. On the other side press either concentrates on the enormous potential that virtual communities have or alarms of their threats to the society and its norms and to individuals. As there is a large confusion around the term virtual community, it seems worthwhile to clarify it before proceeding with further discussion.

Romm et al., 1997 give the broadest definition of virtual communities. They define them as groups of people who communicate with each other vie electronic media. According to authors the definition needs to stay that broad, as any definition that attempts to capture the essence of virtual communities beyond the simple fact that their members do not communicate face-to-face, may not apply to all their varieties. Erickson (1997) defines virtual community as, "long term, computer-mediated conversations amongst large groups." Hagel and Armstrong (1997) also emphasize that virtual communities are placed on the Net and serve as communication channels for large groups of users. However, their definition also includes content, which is created by users and adds value to the community. They define virtual communities as "computer-mediated spaces where there is a potential for an integration of content and communication with an emphasis on member-generated content." On the other side, Ridings et. al (2002) proposes that virtual communities are characterized by commonality of interests and practices of its members. He defines virtual communities as "groups of people with common interests and practices that communicate regularly and for some duration in an organized way over the Internet through a common location mechanism".

However, these four definitions somehow miss the point of community as they focus on web spaces that just enable information exchange. Jones (1997) calls such defined web place a *virtual settlement*. He emphasizes that for a virtual settlement to be qualified as a virtual community, it needs to exhibit strong affective bonds between its members. This point is also stressed by Howard (1999) who defines virtual communities as "Social aggregations that emerge from the Net when enough people carry on public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace". Howard emphasizes three factors that describe virtual communities best: (1) the activities are carried in the cyberspace (Net), (2) participants meet for the purpose of discussion, either to share knowledge, opinions, feelings, or common topics of interest, and (3) that with time participants develop a self-sustaining relationship amongst themselves. Emphasis on relationships is also given by Rheingold (2000).

Different approach to defining virtual communities was taken by Krieger and Muller (2003) who define virtual community as "an aggregation of individuals who solve problems of collective action online, for a set of issues in a communicative process, by alluding to a set of beliefs." Instead of emphasizing relationships between community members, they stress a common sense of beliefs about the community shared by its members. Finally, Craig and Zimring (2000) emphasize that in virtual communities their members have a *sense of community*. Members of virtual communities understand that they are a part of a community and have a strong felling of belonging to such a community.

Basing on the above definitions, for the purpose of this paper virtual community is defined as follows:

> Internet based, long-term communications, between groups of people, who share common interests, and feel the sense of belonging to the community. The communications have human feeling and lead to emergence of personal relationships between the community members. Content or other collective goods created as an outcome of the communications add value to the community.

3.2 Characteristics of virtual communities

The definition presented above points out several characteristics of virtual communities**.** They are (1) Internet based, hence typically do not involve face to face communication. As such they grant some sort of anonymity to its users, allowing them to change their identity for the purpose of the Web. They are based on (2) long-term communications. This implies that users come back to the same webpage, chat room or any other virtual space and are continuously engaged into the communication there. The members of community (3) share the same interests, and those interests are the reason for them to be involved in the community. These can be similar hobbies, similar problems or any other commonalities. The community is focused on those common interests; however the communication does not have to be entirely centered on them. Users feel (4) that they form together a community. They have a feeling of belonging to the community as a whole and a feeling of relatedness to other members. The long-term communication (5) leads to emergence of personal relationships between users, which can be extended outside the community. Users can (but do not have to) create content or other collective goods (e.g. prestige of the community) that are an outcome of communication. They add value to the community, which can be a reason for new members to join the community.

In addition to abovementioned, the literature proposes some other characteristics of virtual communities. Table 3 presents the most often mentioned and authors that pointed to them.

Table 3. Characteristics of virtual communities

Characteristics	Source
Irrelevance of physical location – virtual communities has global reach and can be accessed regardless of the physical location of a person.	Agres et al., 1998; Affuah and Tucci, 2003; Erickson, 1997; Hagel and Armstrong, 1997; Howard, 1999; Kelly, 1998; Rheingold, 2000; Romm et al., 1997; Sproull and Faraj, 1997
Not existent problem of time – user can participate regardless of the time zone in which they are located, their schedules, working hours, habits, etc.	Agres et al., 1998; Affuah and Tucci, 2003; Erickson, 1997; Hagel and Armstrong, 1997; Howard, 1999; Kelly, 1998; Rheingold, 2000; Romm et al., 1997
Real world anonymity – users do not bear they identities from the real world (sex, age, education, financial status, ethnicity, etc.), but have virtual identities under which they are known and judged by the community. As a result virtual communities are more heterogeneous than physical face-to-face communities. Also because of that virtual communities have more passive members who only observe the community, than active ones, who participate in the communication.	Erickson, 1997; Hiltz and Wellamn, 1997; Howard, 1999; Rheingold, 2000; Sproull and Faraj, 1997
Shared interests (or goals or beliefs) – although members' past experiences are very different to each other, they participate in the community because they share common interests, goals or beliefs. They may also share common history or practices.	Falk, 1995; Howard, 1999; Krieger and Muller, 2003; Ridings et al., 2002; Rheingold, 2000
Long-term communication – members communicate over longer term and repeatedly come back to the community web space.	Blanchard and Markus, 2004; Erickson, 1997; Hagel and Armstrong, 1997; Hiltz and Wellman, 1997; Howard, 1999; Rheingold, 2000; Romm et al., 1997
Sense of virtual community – members share a sense of belonging and attachment to the community. It is a base for setting boundaries of the community, developing and maintaining community norms, social control and for a voluntary commitment of members and their generalized reciprocity.	Blanchard and Markus, 2004; Craig and Zimring, 2000; Falk, 1995; Krieger and Muller, 2003; Ward, 1999
Clear boundaries – virtual community has clear boundaries and issues of membership and exclusion are central to it.	Baym, 1997; Blanchard and Markus, 2004; Curtis, 1997; Erickson, 1997; Greer, 2000
Social control – communities develop and maintain own norms.	Baym, 1997; Blanchard and Markus,

Community members control behavior of others threatening those who brake them with exclusion from the community.	2004; Falk, 1995; Ridings et al., 1997
Personal relationships among members – community members form relationships with one another. These relationships can range from friendships or emotional support to roles reinforced by the structure of the community (e.g. "hosts" and administrators). These relationships can be extended to the real world, between single members or even the whole community for example as during gatherings of virtual communities such as IRC channels.	Blanchard and Markus, 2004; Erickson, 1997; Greer, 2000; Howard, 1999; Jones, 1997; Rheingold, 2000; Sproull and Faraj, 1997; Ward, 1999
Commitment and generalized reciprocity - virtual community implies a sense of mutual commitment on the part of the participants, members help each other simply because they belong to the same community.	Baym, 1997; Blanchard and Markus, 2004; Erickson, 1997; Greer, 2000; Ridings et. al, 2002
Voluntary creation and redistribution of collective goods –members voluntarily, often as an outcome of communication, participate in the creation, control and distribution of various collective goods.	Blanchard and Markus, 2004; Erickson, 1997; Hagel and Armstrong, 1997

3.3 Types of virtual communities

According to Hagel and Armstrong (1997) people interact in the virtual communities to fulfill four basic needs: interest, relationship, fantasy and transaction. Basing on this classification, they distinguish (1) *communities of interest*, where people meet to share an interest or an expertise in a specific topic, (2) *communities of relationship*, where people with similar experiences group and form meaningful relationships, (3) *fantasy communities*, where people group to explore new worlds of fantasy and entertainment, and (4) *communities of transaction*, where people meet online to trade information between participants.

Jones and Rafaeli (2000) also divide communities according to their use. In addition they propose to divide them according to their social structures – social networks formed by users and specific to some particular virtual communities. Examples of such community types include virtual settlements, cyber-inns, virtual airport bars, virtual voluntary associations, etc. They finally propose to divide communities according to their technology base, which is generally faulty as many communities use many technologies combined, such as chat room with e-mail listing and bulletin board, or MUD with Internet Relay Chat and bulletin board.

Kozinets (2002) distinguishes five types of virtual communities on the basis of their social structure and group focus:

1. **Boards** – Internet bulletin boards such as newsgroups.
2. **Rings** – bring together thematically linked web pages.
3. **Lists** – e-mailing links united by a common topic of interest.
4. **Dungeons** – virtual locations with interactions structured by role-playing rules, such as MUDs, MOOs, MUSEs.
5. **Chat rooms –** virtual locations loosely organized around common interests.

The taxonomy has rather general character. First, it limits itself only to five types of virtual communities. Second, it does not include the possibility that web communities can use different means of communication as discussed above. Thirdly, it is not applicable to every situation, as there are boards, chat rooms, MUDs and so on that do not have real virtual community character. Moreover, there are chat rooms with very tight social structures as well as dungeons or lists with loose ones. However, it can provide general overview of virtual communities character. The topography of virtual communities is presented on figure 2.

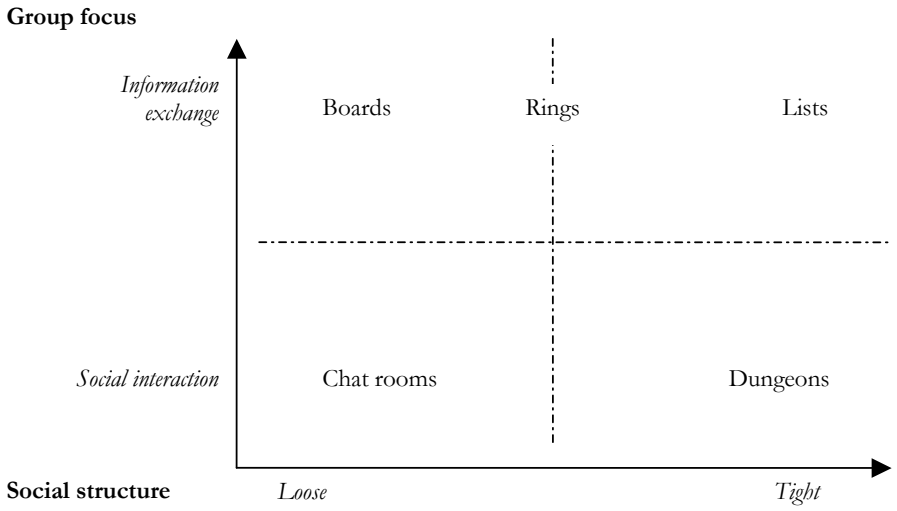

Figure 2: Types of Virtual Communities, source: Kozinets (2002)

None of the presented classifications covers every aspect of virtual communities and is applicable to every virtual community. However, they provide good overview of what virtual communities are or can be and as such are good starting point for discussion on virtual communities in P2P file-sharing networks.

4 Virtual communities in P2P file sharing networks

4.1 Positive impact of virtual communities on P2P file-sharing networks

According to Kelly et al. (2002), there are three major questions that designers of online communities need to face: (1) how to get users to behave well, (2) how to get users to contribute quality content, and (3) how to get users to return and contribute on an ongoing basis. Looking from the perspective of the P2P file-sharing networks, designers need to face very similar problems. First, they need to answer the question how to get users to behave accordingly to the network rules, e.g. not distribute malicious files or illegal content. Second, they need to answer the question how to get users to passively contribute to the community, i.e. dedicate some part of bandwidth to uploading, share files which they have downloaded and anyways store on their computers, stay connected to the community also when they are not downloading files. Finally, they need to answer the question how to get them actively involved into P2P file-sharing network, i.e. add new files to the network, create other types of content, such as reviews, playlists and help eliminate malicious files and users violating the rules of the network.

Virtual communities and P2P file-sharing networks have many things in common. There are also many phenomena that occur in virtual communities that would benefit P2P file-sharing networks if such communities would be existent among their users. As Blanchard and Markus (2004) point out, when a virtual grouping has a sense of virtual community, members of the grouping are more loyal, altruistic, courteous and willing to submit to informal norms and practices in the community. Sense of virtual community encourages people to commit to the community and involve into the community activities. From the P2P file-sharing perspective it is worth nothing, those members of virtual communities tend to not only behave accordingly to the community rules, but also encourage others to do so or even control behaviors of others. They commit to the community and exhibit general reciprocity. They also voluntarily create and distribute collective goods, adding value to the community. When individuals feel they belong to communities, they act as if they had a collective consciousness (Krieger and Muller, 2003).

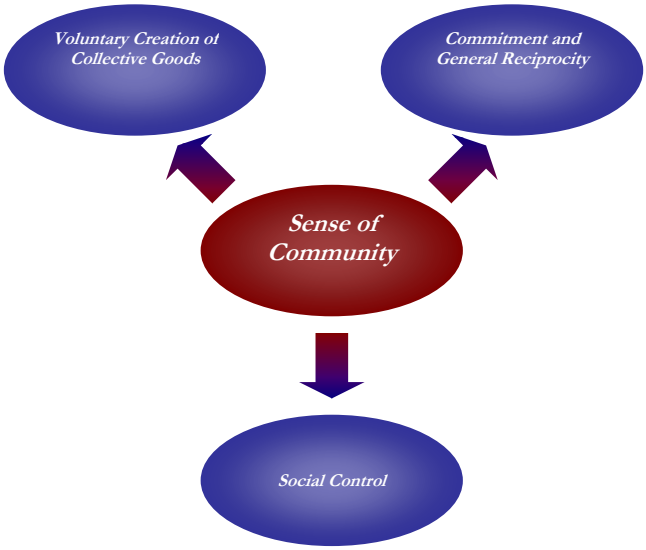

Figure 3: Positive impact of virtual communities

Almost all current web communities are a result of a priori planning and implementation or at least some control and a central authority (Khambatti et al., 2004b). On the contrary, P2P networks are completely de-centralized and often have very dynamic character. This makes the development of virtual communities within P2P files sharing networks difficult. However, firms that decide to invest in that should find it worthwhile. By encouraging and supporting development of virtual communities within P2P file-sharing networks, companies running such networks can solve the problems of getting users to behave well and not to destroy community value, to get them to passively engage in the community by sharing own files and bandwidth and finally to create and distribute collective goods, whether the files, or reviews, playlists, comments and so on. Community can also increase conversion and visit frequencies (Rheingold, 2000). Moreover, members of virtual communities tend to purchase significantly more from the companies hosting the communities than non-members (Krieger and Muller, 2003). They are also more loyal (Maclaren and Catterall, 2002), as community increases their switching costs. In addition, they can help popularize the adoption of P2P file-sharing service, among their friends (Maclaren and Catterall, 2002), thus helping the network to achieve the critical mass for the network externalities to start to work.

4.2 Innovative features of eMule client

For the purpose of this analysis the eDonkey2K P2P file-sharing network was chosen. eDonkey2K is currently second biggest and fastest growing file-sharing network with an average of more than 2 millions simultaneous users and 290 million files available. The network can be accessed via three software clients, eDonkey, mlDonkey and eMule. The decision to choose this network for the analysis has been dictated by the fact that eDonkey2K has the most advanced features supporting the development of virtual communities out of the major networks. In addition, it offers many interesting mechanisms for dealing with the free riders problem.

The most popular eDonkey2K client is eMule. eMule is an open source project (www.emule-project.net) developed by volunteer programmers and distributed freely of charge. In addition to being a major client for eDonkey2K network, eMule also supports Source Exchange and new KAD network. eMule offers unique set of features that made it so successful and supported the fast growth of the network. Queue and credit system helps to ensure that all users of the network will regularly at least passively contribute to the network by sharing files and dedicating bandwidth for uploads. It supports web-based searches based on hash links. It helps to minimize harmful impact of malicious files and counterfeits sinking into the network. The other way of solving that problem is through comments. The messaging and friend system facilitates not only communication between members of the network, but also helps establish personal relationships among members and even virtual communities of users within the network. Finally, IRC enables multi-user communication and development of communities around discussion channels. These four features are described in detail below.

Queue and credit system is used to solve the free riding problem, by encouraging peers to contribute to the network by sharing files and bandwidth. In order to download anything from other client users need to wait in the queue. The credit system provides a major modifier to this waiting time. User advances in the queue basing on the amount of data he uploads to the other client and downloads from that client. In that sense the client enforces reciprocity. Users who do not share valuable content will find very hard to advance to the first position in queues, as every new person in the queue who does upload will push them down the queue.

Support for hash links allows P2P file-sharing users to indirectly control the content in the network by recommending verified files. Several web pages on the network (e.g. www.sharereactor.com, www.osloskop.net, www.osiol.com, www.osiol.pl) contain databases of hash links to files that are verified, i.e. do not contain malicious code and are not counterfeits. Small communities of volunteers, who communicate with each other via dedicated IRC channels, host those web pages updating them on a daily basis. This helps to minimize the amount of malicious files in the network, as they are not spread around it. This creates the value for the P2P file-sharing network, ensuring its vitality. Some of these web pages also allow users to contribute to the system by rating files, or posting own reviews and comments.

Users can also contribute to the network, by commenting files within the eDonkey2K network. Many of the popular files within the network contain such comments.

Networks supported by eMule are very large and it is very hard to remember all the people met within it. Hence, the **friends feature** was released to enable an easy and convenient way of keeping track of people who you know, or who have same liking and interests. The feature enables users to do many simple, but powerful things. First, it enables them to keep a track the availability of the P2P file-sharing friends. The friends are also visible in the messages window, enabling user to start a private chat session. Users can also set the preferences to allow friends to browse through their shared folders, sharing in that way information about their taste, files they see as valuable, music and movie own interests, and enable them to discover new files that otherwise they would not be aware of. Finally, a user can reserve a slot allowing a friend to make a direct connection without having to wait in the queue.

These two functions combined give significant support for already existing virtual communities within eDonkey2K network, such as groups releasing new files. It also facilitates creation of communities of interest. Members sharing the same interest, e.g. Asian movies, alternative rock, or fantasy books can link to each other through 'friends' features and exchange files, communicate and get informed about new files that any member of the community discovers and downloads. Finally, communities existing outside the eDonkey2K network can extend their interactions also to P2P file-sharing networks, by copying their relationships into the network.

eMule client provides **support for IRC communication**. Users can connect to IRC servers directly from within the client. They are also encouraged to visit channels dedicated to eDonkey2K network and in particular eMule: #emule for English speaking users and #emule-german, #emule-polish, #emule-french, and so on for other languages. There are several virtual communities of eMule users around these channels.

Table 4. Summary of eMule innovative features

Feature	Function	Value for the network
Queue and Credit System	Helps to solve free riding problem.	Encourages users to share files and bandwidth.
Support for Hash Links	Helps eliminate malicious files and counterfeits.	Minimizes the impact of harmful users' behavior on the network.
Messaging and Friend System	Enables tracking of friends within the network. Helps establish friendly relationships.	Help establish new virtual communities within the network as well as extend the scope of existing virtual communities to include P2P file-sharing. Encourages users to stay online and share files. Encourages active contributions to the network (i.e. release of new files). Builds sense of community.
IRC support	Enable communication among eMule users.	Provides help for new users. Encourages users to stay connected to the network. Help establish loyalty and voluntary attitude among users. Supports development of the sense of community.

4.3 Virtual communities within eDonkey2K network

eDonkey2K network is used by tens of millions of peers and on average has more than 2 millions simultaneous users. Although developers and some of the users refer to eDonkey2K as to community, as a whole it does not meet the criteria of a virtual community. Large majority of users threat it only as a tool for exchanging files and do not feel the sense of community. These users do not have the feeling of membership. They do not recognize the network as a community and do not identify with it. They also do not develop emotional connections within the network. These users tend to behave according to the Olson (1965) criteria for rational behavior. They act passively, connecting to the network only when they have a need for particular files and share only what they have downloaded and only as long, as this is in their best interest. This state, thought not optimal, can still lead to a development of successful network. As Cunningham et al. (2004) shows, in such organized network as for example Mule, when users have incentives to passively participate in creation of network value, a small handful of altruists is enough to support maintenance and further growth of the network. This explains how eDonkey2K network was able to growth that fast recently, when the other networks were loosing its users because of the free riders problem, decrease of the files quality as a result of malicious files and counterfeits sinking into the network and finally due to recent PR and legal actions from organizations protecting copyrights.

There are for types of virtual communities among eMule users that together are responsible for most of the network value. For the purpose of this paper they are called *Releasing Groups*, *Controlling Groups, General eMule Communities* and *Other Communities*. These four groups are described below.

Releasing Groups are typically underground groups that release new files (e.g. movies, audio, software) to P2P networks. Together they form an underground community, sometimes called warez community. Members of this community release most of the files that are available within P2P file-sharing networks (for the details see Appendix 2). Hence, they are responsible for the most of the value in those networks. They use IRC channels for communication. However, in eMule network they also function as communities tied with the *friends* function and communicating via private chats.

This group, especially due to its underground character, exhibits strong characteristics of a virtual community. Users have shared interests, goals and beliefs about the community. They engage into the community for the longer term and pass several levels of membership. The community has clear boundaries and users share strong sense of belonging and attachment. Also the members form strong personal relationships with one another. Their positions in the group are based on the value they create for the group. Those responsible for highest number of high quality releases have highest prestidge.

Controlling Groups are the groups of users that aim to increase the quality of content available within the network. These communities are typically formed around websites that provide hash links to the verified files within P2P file-sharing networks. Thus, they create value for the network, by minimizing negative impact of harmful behavior of other network users. Very often these users also establish IRC channels on which they meet, exchange information on new, verified files and contact with members of releasing groups.

These communities have shared goals, thought interests and beliefs of their members are often different. The membership has a long-term character, but many temporary members also visit the channels and contribute to the network by informing of new verified files. The members in these communities also develop relationship with one another and have a felling of community they form on a eMule network.

General eMule Communities group all those eMule users who seek more than just a tool for exchanging files. These users regularly meet on eMule IRC channels such as #emule or #emule-germany and discuss issues related to the network. They also provide support for new users searching for help. They are also often dedicated to development of the network and either help in developing the software, release new content, or contribute in other forms. There are very strong personal relationships between members of these communities – similarly to Release Groups and Controlling Groups channels. The relationships extend outside eMule/eDonkey related topics, which is visible as their discussions often cover private topics relevant to the users of the community and only understandable to the community participants. These users exhibit very strong sense of eMule community, thought they do not see all eMule users to be members of the community, but rather those people with whom they more or less regularly communicate, those people who run eMule related web pages, or for any other reasons are not anonymous and are recognized by other users. These users are very often linked with each other on the eMule network through the *friends* feature.

When asked, many of these users admit donating small amounts of money for development. Many of these users also admit to have purchased eMule related merchandise, cups, mugs, t-shirts, hats, and so on, that make them recognizable also outside the Internet, as members of the eMule community.

Other communities are groups of people who share same interests or form a community also outside the eMule network. Those people link to each other via *friends* feature and communicate using IRC channels and private chat sessions. These communities are very different in nature ranging from closely tied groups with strong personal relationships and sense of virtual community to more loose groups of people sharing the same interests. It is hard to estimate actual size and number of such communities with the eDonkey2K network. However, out of 40 users of #emule and #emule-polish channels asked, 29 answered that they are otherwise engaged in such private communities apart. Unfortunately, as all the users asked were heavy users, otherwise engaged into development of the network, they are not a good representative group.

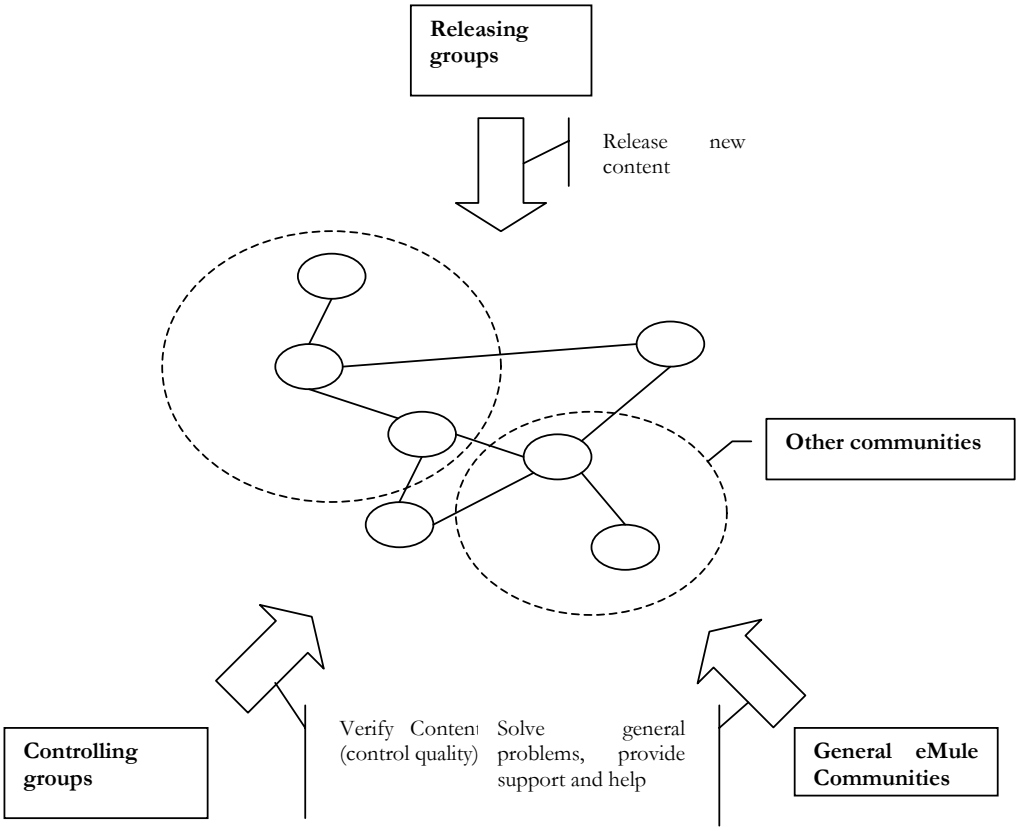

Figure 4: Virtual communities within eMule/eDonkey2K network

These four communities together are responsible for most of the value the eDonkey2K has for its users. Their members, also often anonymous in the P2P file-sharing network, have virtual identities and are recognized, by members of their communities. They have strong sense of their communities, share common interests, beliefs or have common goals. Because of strong personal relationships between users they tend to spend on average more time connected to the network. They are responsible for the development of the network, releasing of new content and other creating value actions, which can be attributed to the voluntary commitment resulting from the feelings of belonging to the network and general reciprocity. Their communities have strong inside norms and regulations, which they try to move also onto the network. For example new users searching help on #emule channel will also be instructed on the rules of proper behavior on the network, encouraged to share and comment files, and so on. These communities have more or less clear boundaries with Releasing Groups being the closest ones, with issues of membership and exclusion being very important, while Other Communities have the loosest character. The example of eDonkey2K network, and eMule users clearly shows have valuable can virtual communities be for the P2P file-sharing networks.

4.4 Ideas for supporting development of P2P file-sharing within networks

The features developed as a part of eMule project prove that by supporting the development of virtual communities within the P2P file-sharing networks companies can encourage consumers to create value for the network and significantly contribute to the network success. P2P file sharing networks prove to be much more difficult areas for the development of such communities due to dispersed architecture and massive amount of users, incomparable with most of the virtual communities on the Web. It is practically impossible to control and steer into right direction behavior of millions of anonymous users. However, even relatively small in numbers communities of enthusiasts can contribute to the network significantly enough to minimize harmful behavior of network renegades and create enough consumer value to make joining the network worthwhile for massive users.

General reciprocity (Cunningham et al, 2004), otherwise termed as 'fairness' (Fehr and Gahter, 2000) is recognized as one of main factors affecting users' tendency to contribute to the network. Vassileva (2002), in addition identifies four additional ways of motivating users to participate in the community: (1) by influencing user's feelings (e.g. feeling of guilt or feeling of belonging) in order to motivate altruism towards the community, (2) by rewarding with reputation or visibility in the group, (3) by enabling development of relationships with other community users, and (4) by providing economical incentives for the involvement (e.g. priority in the queues, higher service quality). These are clearly visible in the examples of communities in the previous section. Here are presented three additional practical ideas for minimizing harmful behavior and encouraging users to more actively contribute to the network.

Although originally many P2P file-sharing networks were created to facilitate sharing of self-created content, rarely any user is doing that. One of the things user value most in these networks is easiness and simplicity of searching and discovery. There is a large opportunity space for supporting the sharing o user tastes and fascinations. Amazon.com and many music websites already have given users opportunity to list their own playlists, rankings of favorite movies, books and music in particular genre. It seems that web places supporting hash links, which are now the major place for searches in P2P file sharing networks, could include that feature too. This would allow users to share their tastes and interests and in that way contribute to the network. It would improve the discovery process for the network participants. Also it enables building of the reputation inside the network.

One of the features, which can be implemented on the network architecture basis is the ability to rate files. Hash links and comments provide information whether files are verified to contain the content specified by the file name. However, they do not say much about the quality of the file, hence users need to check Internet websites to find out information about movies, music and so on. The same way users comment files, they should also be able to rank them, for example on the 1 – 10 scale. Hence, it will allow users without specified search criteria to look for example for highly ranked rock records or new movies. This feature could be especially useful for the firms that want to build their business models on the distribution of new, not know artists, music from indie labels, or user-created content (e.g. amateur movies). As highly ranked files in the network will improve prestige and reputation of their creators, users seeking those two will be more motivated to create and release high quality content to the networks. Those two issues are very essential for driving participation in open user networks (Adar and Huberman, 2000).

The third feature is related to creating more 'trustworthy' environment in P2P file-sharing networks. As Alexander (2002) argues, the capacity to identify and punish defectors is essential for the stabile functioning of such networks. Several studies analyzed the means by which virtual communities manage themselves and the conventions that these communities establish. For example Mynatt et al. (1998, 1999) analyzed Multi User Dungeons (MUDs) and chat rooms, while Becker and Mark (1998) analyzed Collaborative Virtual Environments (CVEs). However, in case of P2P networks the problem is more complex. Due to their dispersed character it is practically impossible to exclude users from the networks for their harmful behavior. Currently, the only legal mode for punishing pedophiles within such networks is to prosecute them, what is the responsibility of police. It is practically impossible to use automatic filters for reviewing such illegal content, because many P2P file-sharing networks start to include encryption mechanisms for transferred content. There were several attempts from within the community to solve the problem – hackers attacking those sharing such content with Denial of Service (DOS) attacks. However, such form of punishment is illegal. There is currently no other way for excluding such users from the network. Hence, it is proposed to apply to the file-sharing networks trust model developed for Internet auctions. Users who successfully downloaded content from one or more sources should rate the downloaded content, marking whether it was the right file, counterfeit, file containing malicious code or other harmful file. Those rates will be passed on clients ranking the people who shared those files. This would affect their trust modifier. Several additional features could be built on top of this. For example, users might want to block downloads from and uploads to users with ranking below certain level, or even

users whose trust level dropped to minimal value would be excluded from the network. On the other side, the ones with high trust ratings could be rewarded with improvement in quality of service (e.g. better places in the queues) and with prestige (e.g. ranking of most trusted peers). Although this system is not enough to exclude all the users who perform harmful actions, it could significantly reduce their number.

5 Summary

P2P file-sharing networks are loose groupings of users and cannot be considered virtual communities. However, within these groupings smaller virtual communities exist that account for majority of the value created by the network users. Members of such communities exhibit strong sense of community and are tied with personal relationships. As a result they are more willing to voluntarily contribute to the common good of the network and as a result they, in the long-term, are responsible for success or failure of any file-sharing network. These members are the ones contributing most to the networks by improving the breadth of content available and supporting other people experience within the network (e.g. developing client software, improving searches with hash links, providing help to new users). They also tend to be more loyal to one network and voluntarily promote the network outside its boundaries, which is very important in the Internet world where the 'word-of-mouth' has very strong marketing power. However, in order for communities to emerge within file-sharing systems, companies need to provide features facilitating their development and in addition personally support the emergence of such communities, for example by asking developers to visit the community IRC channels. The features should provide means for recognizing member of such communities, private and group communication between those members, and finally for rewarding the membership in such communities.

Virtual communities can reduce the two problems that currently hinder the development of P2P file-sharing networks, problems of free riding and harmful behavior of users. However, they cannot eliminate them entirely. As an example of eMule client shows, the best way to eliminate free riding is to combine the positive effects of virtual communities with automatic systems that reward for sharing files and dedicating own bandwidth for uploading. Probably a combination of automatic filters, or databases of counterfeited files with community-based control from network users could prove to be effective to solve the second problem.

This research presents several existing solutions that facilitate development of P2P file sharing networks as well as it presents new ones. Companies can utilize those ideas regardless of the type of file-sharing network they plan to develop and business model they want to build around it. However, this paper does not provide exhaustive list of already existing successful solutions as well as it does not propose remedies for all pointed problems. In particular, there are no viable models for elimination of harmful behavior of users within P2P files-sharing users. The future research in that area is needed.

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Appendix 1 – P2P file-sharing architecture

Centralized system (e.g. Napster)

User client software sends information about shared files to centralized servers, in this case Napster servers. All files are indexed in the central Napster folder. Whenever user searches for any file within the network, (1) user's client sends the search query to the central server. (2) Napster searches through the database and if the file is available within the network, it sends response providing IP addresses of computers that store searched file. After getting that information (3) user directly connects with provided IP addresses and starts to download file (or wait in the queue if all ports are already used by other peers).

Solid lines represent communication client-server. The communication includes (1) transferring information about shared files, (2) search queries and (3) responses to search queries.

Discontinuous lines represent direct communication between peers, i.e. transfer of files.

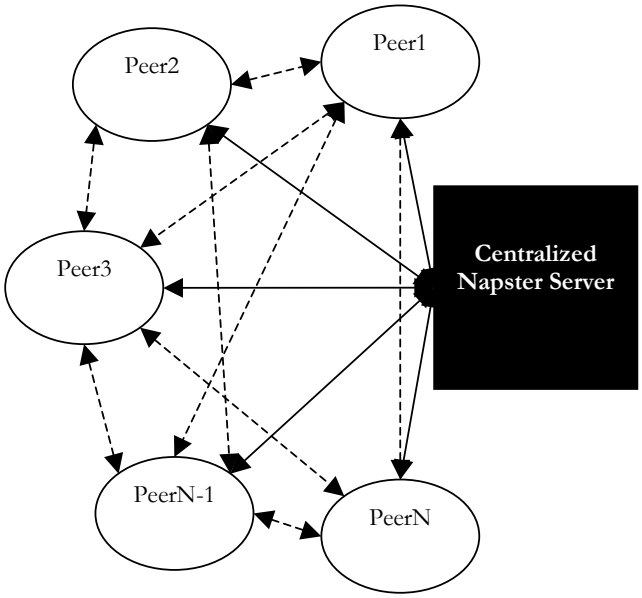

Figure 5: Architecture of a centralized P2P file-sharing network

Decentralized system – (e.g. Gnutella)

In the decentralized network there are no central servers. Users' software clients play role of clients (consumers of information) and servers (suppliers of information). Some user clients (depending on bandwidth and user willingness to do so) also serve as hosts that connect and route information between clients and servers. Users connect to these hosts to login to the network. These hosts facilitate communication between users providing the IP and port address information to the Gnutella client software. Once connected to the network, peers interact through messages. The message types available are presented in the table below.

Table 5. Types of messages in the Gnutella network

Message	Function
Ping Message	Message verifying presence of other peer in the network
Pong Message	Confirmation of the presence in the network, a reply to ping message. It contains such information as peer's IP address, port, number of flies shared and total size of these files. Peers in the network forward this message to further facilitate finding of other users.
Query Message	These are search queries, which are forwarded through entire network. They are uniquely identified, but their source is kept anonymous.
Query Response Message	These are replies to query messages. They include information necessary to start downloading the file, i.e. IP, port, and other location information. This message is propagated backwards along the path to original query message took.
Get/Push Messages	Get messages are simply requests for a file returned by a query. Push messages request the serving client to initiate the connection and upload the file. They are used when the source of the file is behind the firewall preventing directly responds to file requests.

The typical download in the Gnutella network is organized as follows. (1) User's client sends search query message to neighboring clients. This search message is forwarded further to next clients. To prevent messages from being indefinitely broadcasted over the network peers have a short memory of messages that have been routed through them (preventing re-broadcasting). In addition, messages are flagged with a time-to-live (TTL) field. After going through each hop in the network the TTL is decremented, till it reaches the zero, at which time it is dropped. (2) When the file is found, a query response message is sent back to the originator of the search query message. (3) The two clients connect and the transfer is started.

On the figure below **solid lines** represent connections between neighboring clients. These are the connections used to forward search query messages.

Discontinuous lines represent direct connection between any two peers in the network. These connection occur when the IP address of a computer storing particular file is known and peers connect in order to transfer the file.

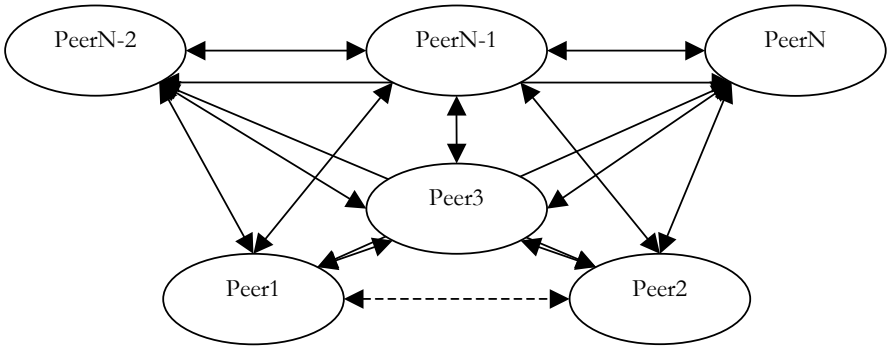

Figure 6: Architecture of a decentralized P2P file-sharing system

Appendix 2 – Major source of P2P file-sharing networks value

When asked to name what the real value of P2P file-sharing network is, most consumers answer that it is the breadth of content available and the simplicity of search, discovery and obtaining new content. However, the value of these networks is not created by large number of peers who rip their own CDs and DVDs to contribute to the networks in exchange for the file they download. According to the study conducted by Adar and Huberman (2000) more than 60% of Gnutella users not only do not contribute new files to the networks, but even not share the ones they have already downloaded from the network and store on their PCs. Just the top 1% of sharing hosts returns more than 50% of all search responses. The real value of the networks is created by few individuals who contribute large amounts of high quality content. Figure 5 presents the path most files go through before getting to the P2P file-sharing networks.

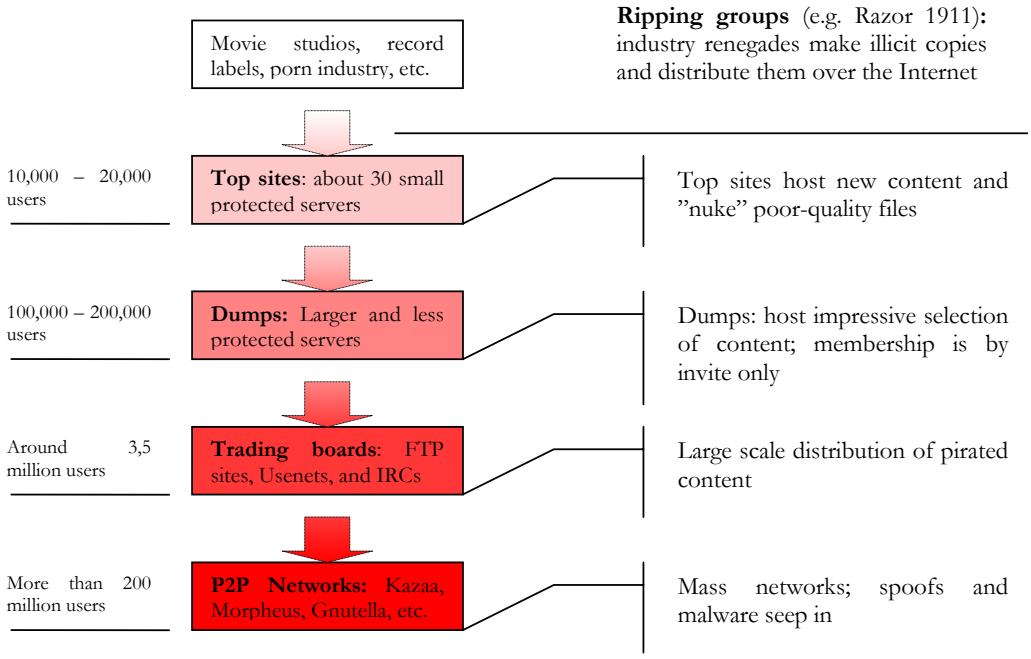

Figure 7: The origins of content in P2P file-sharing networks (source: *Wired*, June 2004)

Betting on virtually simulated games – Case Hattrick

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Abstract

Online gambling is a steadily growing business with a bright future, especially since recent legal decisions seem to go in favour of cross-border online gambling and against state run monopolies. This is a fact already today in the EU, and because of rulings by the WTO the USA will probably be forced to follow. On the other hand online, virtually simulated, sports leagues are becoming increasingly more popular. The question then is, can these two be combined to create a viable business opportunity. This question is approached as a case study surrounding the Hattrick online football league in this paper. Some conclusions are drawn, and needed future work is outlined.

1 Background of the study

Hattrick [5] is a rapidly growing, free online football game. The idea is to coach your team and players, and to become the best team in the world. The idea of the game is very plausible, since it has already attracted a lot of attention. You play weekly games in a league, against a team coached by another player. The community aspect behind the game is very strong. The game can now be played in 76 countries and is available in many of the countries in their native language. A player can also buy a supporter system, which gives the player more statistics and possibilities to personalize his teams. The game is constantly being developed further and it is spreading to new markets all the time.

An interesting question is if organized betting could be possible in virtually simulated games, like e.g. a game like Hattrick. Would a person bet money in a game that is simulated by a computer according to probabilities and random events, and then accept the outcome of it? Betting on simulated online games would open many windows of opportunities. The betting possibilities would expand massively and the interest towards the online simulation games would explode. Perhaps games simulated purely for the betting purpose would be created. But there are also threats. The players could e.g. easily lose on purpose and have somebody bet money on the opponent on their behalf. The position of the players playing a game, that is a betting object, would change radically.

Hattrick is an interesting growing online football manager game with a strong community. Betting on a game like this sounds intriguing, but what are the possibilities and threats? Could a working betting system be built around a game like this? Considering the answer to the previous question to be yes, then how?

1.1 Research problem

The research problem is not a direct research problem, more of a study of Hattrick combined with a study of betting on online simulated games. The main research of the study can accordingly be divided in two categories; the Hattrick game community and the betting. The research problem questions could be expressed as:

How does the Hattrick game and community work and is there a business idea built around it?

The betting question can be narrowed down into two sub-questions:

Are there any betting services for online simulation games available on the net?

Could a working betting solution be built around a simulated game and what would the critical factors of the system be?

1.2 Objectives and methodology of the study

In order to provide answers to the research problems we will have to study the Hattrick game and the active communities. The research about available betting services will involve lots of searching the net. To be able to evaluate the possibility of creating a working betting system, available real world betting systems

will be studied. Also a person involved in online betting at Veikkaus will be interviewed to gain more knowledge about online betting. Objectives can be broken down into the following issues:

Collect information about the Hattrick game and the active communities

Search for possible available betting services on the net

Evaluate the possibility of creating a working betting system for Hattrick

Generalize the results for online simulation games

The study is a case study divided into two smaller case study parts. The Hattrick case study is somewhat separate from the case study on betting, although the results of the betting study are synthesized to meet the needs of the Hattrick case. The two cases are first studied separately but the needs of the Hattrick case are taken into consideration when estimating the possibility of creating a working betting system.

1.3 Scope of the study

The only actual online simulated game taken into consideration here is Hattrick. The results of the betting are tried to be generalized, but can of course not be generalized for all kinds of online simulated games. The result of the study is also not a recommendation to any parts involved in the study.

2 Hattrick and Hattrick communities

2.1 The game

Hattrick is a free of charge web-based football management computer game. It was created in Sweden already back in 1997 and is currently made up of seventy-six national leagues with a total of around 300.000 managers and their teams, from all over the world. In Finland there are 6 divisions with a total of 10.920 teams. The biggest national league is the Swedish league with 35.496 teams in 9 divisions.

As a manager you run your team using a web browser. Hattrick's website can be compared to a small community, where you are able to tend to your team, communicate with other team owners, do business, and follow the matches live. The possibilities to tend to your team are very broad. You need to e.g. make decisions on what you will practice with the team each week, what is the training intensity, how much you want to invest money in your junior team, what kind of professionals (e.g. doctors, marketing, assistant coaches) you need to have and if you want to rebuild your stadium to fit all your fans. These were just a few examples of all the decisions you have to make as a manager. The team plays two matches each week. One of these is a league match and the other is a friendly match. The manager naturally also has to set up the match line-up and decide what tactics will be used during the games. Trading players is also very important in the game and the trading market is huge. Below in Picture 1 the match line-up layout can be seen. In the menu to the left, below "Tapiola", the links to the different function pages from which you control your team with, can be seen. As can be seen from the picture, the players can be ordered to take more offensive or defensive roles, or even totally different positions. Other options are also possible. The coach can also set the attitude and tactics of the game.

All the divisions in a national league are divided into zones and one zone contains 8 teams. One season in the game takes 14 weeks, which equals 2 games against every opponent. Then there is a two-week pause before the next season starts. If you finish first in you zone you either automatically climb to the next division or have to qualify for climbing to the next division. You also get a bonus if you finish among the best ones in your zone.

A World Cup is also held every second season. All the national leagues have a national team, which is lead by a coach from one of the teams in the national league. The coach can use all the national players in the national league. Sweden was the first league and is still the biggest league, so it has the toughest national team, although Norway beat Sweden in last seasons World Cup final. There has also been some speculation about a Champions League type of cup inside Hattrick, but this idea is still under development. [5]

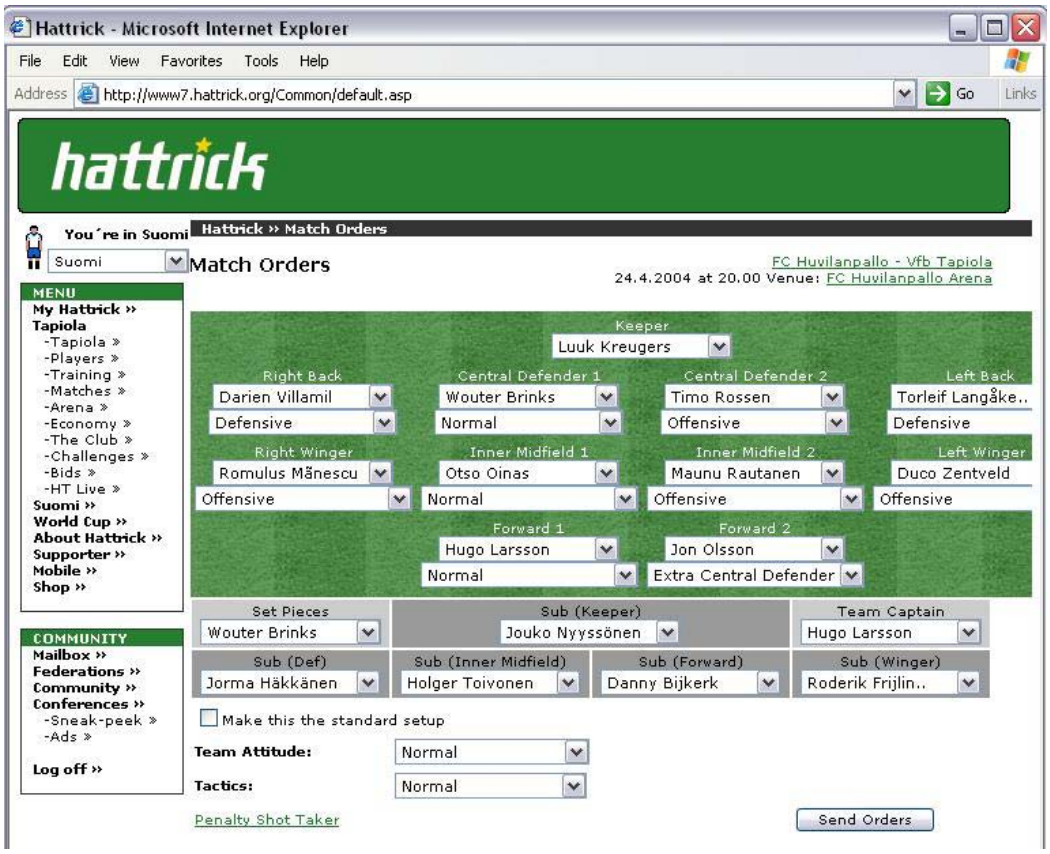

Figure 1. Screenshots of setting a match line-up [5]

2.2 Hattrick community

But Hattrick is not only a game; it is also an active community. The worldwide game community is one of the most wonderful aspects of Hattrick. The creators of Hattrick call the concept of the huge community "Social gaming". There are both national and worldwide community web sites, with e.g. discussion forums, tips, guides, articles and IRC-forums. The community is especially well known for its attitude towards newbies. There are dozens of newbie guides available and the attitude in the forums towards newbies is very positive. Most of the national development work has been made by volunteers, e.g. the translation of Hattrick to national languages. The official Finnish Hattrick community website is HT-Suomi.

The Hattrick cult has grown way beyond just the official web site. Just to analyze your team, players and the tactics for your next match, there are a dozen different programs available, e.g. Hattrick Manager, Hattrick Buddy and Hattrick Assistant Manager. There are also Hattrick newspapers, Hattrick statistics, Hattrick news sites and even Hattrick radio. [6]

Hattrick is also constantly under further development. The game masters are constantly adding new features to the game and enhancing the current ones. The game masters are open to wishes made by the community and, often, these wishes are later incorporated into the game in some form or another.

2.3 Business ideas within Hattrick

Although Hattrick is a free game, there are also business ideas within the game. The players can buy an additional plug-in, called Hattrick Supporter, which is the most important idea. The Hattrick Supporter gives the players access to several features that make Hattrick, as the creators claim, easier and more fun to play. The Supporter does not give the buying team any in-game advantages, just some additional features to deepen the experience of the game.

By buying the Hattrick Supporter a player helps the Hattrick Team to develop the game further. The company Extralives, that at the moment is the company behind Hattrick, is probably supported by the incomes from the supporter plug-in and the advertisement on the site. This is just speculation, but the

actual profit made by the owners of the firm are probably quite low at this point, most of the incomes actually go to further developing the game. The future profits after the game has expanded further can though be remarkable. The cost of the supporter service for one player is 1.62 € per month. The payment can be paid in a three-month period (6 €) or a full year (19.50 €)

At the moment the service consists of: bookmarks, a news ticker, additional statistics, federations, buddy lists, clubhouse, faces, no banner reload and an HT reminder. The bookmark is a service with which the player can bookmark players, teams and leagues and easily access them from one page. With the new ticker the player is immediately informed about things affecting the player's team, messages arriving in the mail box, challenges etc. A lot more statistics is added to the game for the coach to gain more information about opponents, teams and leagues. Federations is a part of the Hattrick community that enables the player to join up to 3 of the hundreds of federations that other users have created, and participate in their discussions. With the buddy lists the player can choose 5 teams that he wants to be a supporter of. This makes the information about the supported team easier to access, and the system e.g. tells you when the coach of the supported club is logged in. The player will also get his own supporters. With the Club House the player can e.g. post a logo for the team, decide a name for the fan club, select own match kits, issue press releases and send newsletters to the Supporters. With the faces feature the player is able to see the faces of his players. With the supporter page there will be no banner reload. The HT reminder can be set to remind the player of anything, it works as a normal reminder.

Another business idea is created around SMS messaging. The player can configure the game to send SMS messages when something happens in the game. In order for the game to do so, the player first has to buy some HT credits with which to pay for the SMS messages. Hattrick shirts can also be ordered from the web site. [5]

3 Legislation concerning online gambling

The internet is packed with web sites that offer online gambling. Online gambling was once considered a long-shot business. Now online betting exchanges that match up gamblers with each other take in about US$5.2 billion annually [12] and the figure is rising steadily. The total amount for online gambling reaches an astonishing US$ 50 billion dollars annually.

There are some different types of online gambling available. There are online casino games where the player places bets on virtual casino games like black jack or roulette. Then there are betting agencies where players can put bets on real sport events like football and horse racing. Most of the casino games are single player games where the players compete against the game and a virtual croupier. The game has a built-in randomness that favors the house, just like at real casinos. Winning on these games is just about luck. There are some multiplayer games, like poker, where a player can play against other players. The difference is that the service provider in the single player games cash in on the bets lost by the player whereas a service provider for multiplayer sites is not directly involved in the cash flow and therefore cannot lose money to players. They merely collect an entrance fee and a percentage of the total bets placed.

3.1 National monopolies loosing ground to Internet gambling

Betting on sport events is the most popular form of online gambling. It does not really differ from betting on sports events through national betting agencies. The only major difference is the legislative point of view. In the European Union, the member states' regulation usually prohibits any other organization than the national lottery organization from arranging any form of gambling activities. With the global Internet, any service provider stationed outside the EU can offer online gambling for EU citizens, therefore circumventing the national monopoly. Because of the differences between the member states' regulation regarding gambling, some states even offer online gambling for citizens in other member states. In the US, the government has tried to close down Internet gambling operating from Antigua and Barbuda offering US citizens betting opportunities. The World Trade Organization (WTO), however, has ruled that this kind of hindrance is not acceptable [11]. In the European Union, similar attempts to ban online gambling have also stumbled upon the same type of legislation. Different member states have adopted or are adopting a national virtual gaming policy. Belgium adopted on the 19th of April 2002 the new National Lottery Act that covers all gaming activities and grants a monopoly to the National Lottery for the organization of games via any information society tool. In the United Kingdom each activity has it own individual regime: gaming, betting and lotteries. The UK has a liberal and comprehensive policy and is a key virtual gaming jurisdiction. Comparing the Belgian and English legislation, we notice that they differ completely. A question arises: can member states restrict cross-border online gaming? European legislation usually overrules national legislation if these two collide. Article 49 in the EC Treaty states that member states may

not impose restrictions on the freedom to provide services between member states [1]. Restrictions can, on the other hand, be imposed to safeguard public order, that is, protect the players and the society from fraud etc. These restrictions must however be necessary to reach the intended objective, proportionate to the objective and non-discriminatory. Restrictions cannot be imposed simply to protect a national monopoly.

The European Union and the US might not entirely be off course as they try to ban online gambling. Internet gambling is just as addictive as casino gambling [2]. But because the national lottery organizations are already involved in online gambling and merely try to protect their national monopoly, there is no real excuse for not allowing other gambling associations to enter the national markets. Vague references to organized crime operating on a global level, does not win much support either. In the age of free trade, gambling over the Internet could be seen as just providing a service that a national organization cannot provide.

3.2 An international approach

In the European Union, the member states have taken on different approaches to regulating online gambling. Internet gambling cannot be totally uncontrolled. The Gaming Regulators European Forum (GREF) is an organization working for a European regulatory framework regarding online gambling [4]. The GREF 1998 Helsinki declaration contains recommendations without statutory force. GREF states that gambling regulations is up to the national states. If Internet gambling should be authorized, then regulation must be as rigorous as for traditional gambling. Furthermore, services should only be offered to residents within the country (national) or there should be mutual arrangements (within the EU). One can not ban players from one country and then expect to market a service in that same country. The GREF declaration also takes into consideration things that the national lottery organizations deal with. Gambling operations on the Internet must be monitored just like traditional lotteries. Otherwise there is a risk that the Internet gambling might be used for illegal purposes like money laundering. The same rules must apply for players participating in online gambling. Minors must not be allowed to participate, the privacy of the players must be protected and the deposit of funds and winnings must be guaranteed. The GREF is only dealing with online gambling for the European Union. Offshore gambling (from outside the EU) must, according to GREF, be restricted. Here the role of the Internet Service Providers (ISP) will be of high importance. They have a responsibility to control the traffic.

3.3 European court of justice opens doors for international gambling

The European Court of Justice has in November 2003 twice ruled in favour of cross-border online gambling. On November 6th, the ECJ ruled in favour of the defendants in the Gambini case (ECJ Case - 243/01) [1]. The defendants had in Italy participated in a gambling organization that enabled bets being placed with the UK bookmaker Stanley via the Internet. Italy, however, only allows gambling by organizations that have an Italian gaming license. These licenses are, like in most countries in the European Union, usually not available for organizations based in other countries. The Gambini case was a typical gaming case just like any previous case. On previous occasions, the ECJ have found that the restrictions where in place and had ruled in favour of the complainant, usually a member state or member state lottery organization. In the Gambini case, the ECJ however expanded its "gaming test" to better suite the situation where a national gaming organization is merely trying to protect its national monopoly and therefore has no real reason to prohibit other actors from entering the market. The ECJ ruling in the Gambini case also suggest that not only data transfer centres may participate in online gambling, but every home user must have the right to place bets over the Internet as well without a middle-hand, in other words, data transfer centres.

The other case where the ECJ ruled in favour of the defendant was the Lindman case (ECJ Case C42/02), where a Finnish citizen was forced to pay income tax on a price won on a lottery in Sweden. The defendant would not have been forced to pay income tax if the lottery had been held in Finland. According to EU member states' gambling legislation, the organization pays taxes in its home country and the winnings are therefore tax-free to the winner [1] In the Lindman-case it was a case of double taxation of a prize. The ECJ rejected the Finnish government's defence arguments about cross-border online gambling being more hazardous both to the well being of the player (gambling addiction) as to the state Finland (organized crime and fraud) because the Finnish file given to the ECJ:

"discloses no statistical or other evidence which

enables any conclusion as to the gravity of the

> risks connected to playing games of chance or,
> a fortiori, the existence of a particular causal
> relationship between such risks and participation
> by nationals of the Member State concerned in
> lotteries organised in other Member States."
> [Smith]

3.4 Online gambling open to anyone within the EU?

With EJC ruling that cross-border online gambling is not illegal nor does it harm the players more than any national online gambling, the market is open for any European gambling organization to enter the market. There have been several disputes concerning marketing gambling opportunities in foreign countries. Marketing might still be illegal but the gambling itself should no longer be considered illegal, at least not within the EU, where both the service provider and the players reside in EU member states. In the US, the Internet search engines Google and Yahoo, which are both US-based companies, have banned certain betting agencies. That is, any search for online gambling will not produce a hit for some online betting providers. Whether or not the EU will follow this line, is not yet clear. There are some signs that this might also become the reality in the EU. But marketing must be kept separate from the service, just like with the marketing and selling of alcohol and tobacco.

The national gaming organizations should now, that the market has been opened, be active in order to maintain their leading positions. National gambling organizations have both the resources to try out new forms of online gambling, and resources to market it. Instead of trying to prohibit every new actor from entering the market and the national players from betting online abroad, the gaming organizations should instead focus on providing service that the players want. A more active role is required of the gaming organizations if they want to retain their market share. Perhaps not jumping on every opportunity but instead carefully analyzing trends and following up what is happening on the global gaming arena. If the national gaming organizations fail to listen to what the gambling community is interested in, they will hopelessly lose grounds to new, more innovative bookmakers from abroad.

4 Betting service for Hattrick

With Hattrick representing new grounds for online gambling, the main challenge is not to build up a gambling system around it but to make it attractive to players. Trust is a very important factor when people select their online gambling site. One study [10] showed that trust is a key issue when selecting an online gambling site. Trust consists of many things. The most important issue is information about how the game works, how odds are calculated and the overall user interface of the game. Contact information that tells how a player can get in contact with the organization behind the site is also important, because it ties the site to the real world. With Internet gambling and the fear for fraud, explaining how the activities are monitored and naming the third party authority that supervises the activity to ensure fairness is important.

Most Internet gambling sites seem to be organized like virtual casinos; there are only a few examples of gambling on sport simulation. Traditional casinos offer various games whose odds concentrate on chance and probabilities, typical examples are roulette and black jack. In these games you can increase your chance of winning by studying the probabilities of different outcomes, but in general they are centred on chance. To ensure that a virtual roulette table is fair and accurately simulates a real-world table is easy; you can create a mathematical model representing the probabilities of different outcomes. Once you have this model implementing a computer-based *engine* that works on the basis of these probabilities is near trivial. This game engine is then the solution to the problem, if you can get gamblers to trust it. Fraud by the gambler, in this case, is almost impossible, the casino can of course cheat but supervising the casino is a relatively simple task. Another issue is if this is currently done. The Hattrick idea is quite distinct from this. In just the same way as you in real life make a distinction between betting on sport events and casinos you need to make the same distinction in the virtual world.

4.1 Why Hattrick gambling would be an attractive offer

The first question that needs to be answered is if there would be an interest towards the service we are proposing to offer. Answering this is somewhat of a tricky question without conducting several research studies. This, of course, is not plausible within the scope of this seminar, due to both time and monetary

restrictions. We still tried to estimate the interest by posting a questionnaire in the Hattrick community forums [8]. The risk with such a questionnaire is of course that you cannot control the demographics of the people answering; you are therefore bound to get a skewed snapshot of reality. Still the initial findings from this simple questionnaire were promising and would therefore validate further research into the issue. During the few days that the poll was posted on the Hattrick forums we received 43 answers, 50% of them were positive to the prospect of gambling on Hattrick online. Out of the 50% that were negative to the idea most seemed to be concerned with fraud; this would imply that if you were able to convince the players about the safety and fairness of the offer an even greater number could potentially be interested.

The Hattrick game is surrounded by a very strong community, manifested in the lively forums surrounding the game. The people actively playing the game seem to be very passionate about it, in much the same way that fans of real football teams are passionate to the brink of being fanatic. This is a very promising observation when it comes to offering extra, revenue generating, services. It is thus quite obvious that most players would be interesting in betting on their own games, the challenge however will be to make betting interesting also to the other players. To be more precise, to those who are participants in the Hattrick game but do not have any direct stakes in the matches being offered as betting targets. Any successful attempt to introduce betting on the games must be anchored in the community, and ideally also leverage the knowledge about the leagues present in the community. By introducing the betting service as integral part of Hattrick and its community we hope that it will be possible to tie in also the other participants of the game. Our proposal for how the betting service would actually work is therefore deeply rooted within the community.

4.2 Which matches should be chosen as betting targets?

Within the Hattrick games there are literally thousands of matches being played each week. The game has 76 national leagues, consisting of many divisions. In addition to this there are cups played in each national league and international cups are currently being added to the game. All this then of course means that there are matches being played all the time. The ideal situation would of course be that everyone should be able to bet on any game they choose, being played anywhere within the Hattrick community. In reality this is not plausible since this would require a very large organization to overlook and the actual sums being invested into each betting target would be very small.

The first distinction that needs to be made is whether to have one large betting system, or smaller national ones. In the real world it is natural that gamblers in Finland are interested in betting on football games being played in the English or Spanish leagues, for example, since these are internationally known and strong leagues in which most of the big international stars play. The teams in these leagues also have fans spread globally around the world; two examples of internationally known teams are Manchester United and Real Madrid. The Hattrick games differ from reality in this sense. There are no leagues that are naturally *stronger* than others in the same sense as in the real world. Currently it would be almost impossible for a team in the Finnish league to beat a team from any of the large European leagues, in the game this is not so. The implications of this is that there is no real incentive for a Finnish player of Hattrick to be especially interested in games in the English, Spanish or any other Hattrick league. The implication of this important difference compared to the real world is that it would most likely make sense to create national betting systems. In this way it would also be possible to roll out the betting systems in steps, not globally at once.

This allows the system to first be piloted and fine-tuned in a league that is deemed to be suitable. The Finnish league could well be a good pilot target. Finland is widely seen as a good market in which to pilot mobile and Internet solutions, the market is sufficiently small to be easy to control but at the same time relatively monetarily strong as well as technologically advanced. Furthermore, Finland has a very strong online presence and people are therefore used to doing business online. Because of the Finnish legislation online gaming has also been a way to surpass the Veikkaus monopoly for some time. Once the multinational cups have been introduced to Hattrick they will probably be very good targets for betting, they might therefore be the exception to the rule of only national betting.

The fact that the betting is limited to the national leagues and cups, at least initially, reduces substantially the number of matches that could potentially be offered as betting targets for each country. Even so the many divisions within the national leagues means that there are too many possible targets, no single one would attract enough attention if the possibility is there for betting on every match. An even larger issue is that it would require too much effort on behalf of Hattrick to supervise that every on which there has been even one bet set is played on fair terms. Therefore the second restriction is that even within the national systems betting is restricted to the games in the highest division and to selected cup matches.

4.3 What kind of betting?

Looking at Veikkaus or other betting companies you see that there are currently an abundance of different betting possibilities. There is the normal betting on, traditionally, thirteen games. The players who manage to get eleven or more correct matches collect a win. Another traditional betting type is odds betting. The betting company gives certain odds for a home win, away win and draw. A bet placed on a win for the home team pays the odds times the amount of the bet back in the case of a home win. A few of these matches can be combined in order to get higher odds, but in order to get a pay out you have to get all the matches correct. In recent years other, more exotic, betting types have also evolved: Betting on the final outcome, betting on the first scorer and many other exotic betting systems.

For Hattrick we propose to initially introduce only odds betting. There are certain limitations on how many matches can be betting targets each round if fairness is to be guaranteed. These limitations are introduced below. As a consequence there can be no guarantee that there are thirteen matches available. This restricts the traditional betting on a fixed amount of games without odds. More exotic betting types can be introduced later if online Hattrick betting turns out to be a success.

4.4 Assuring fairness

4.4.1 Game engine

The game engine has to be fair in order to make the betting possible. For games where chance is the only factor this is easily achieved. For a football simulation game the situation is, however, more complicated. Everyone knows that in a match between Real Madrid and HJK the former is more probable to emerge victorious. The question is how to measure and define this probability. Hattrick has been developed for a few years and its game engine seems to be sophisticated enough to allow betting to be a bit more than a hazard game; knowledge about the individual strengths of the teams also plays a part. Still simulating, for instance, that some teams have a better away record than others, that some teams seem to have difficulties against certain other teams, and other curiosities that you can observe in real life, will be hard. The game engine is still under constant development, we would though argue that even at its present form it is advanced enough to facilitate betting. As it is developed, the dimensions that a player needs to recognize will be increasingly numerous, approaching real life sports. What is important is that the gaming community is constantly kept up-to-date with new features added, so that a few gamers do not receive an unjust advantage.

4.4.2 Choosing matches

In the real world you can take any match from a professional or semi-professional league and be relatively sure that each team will do its best to win. There are of course exceptions to this rule, under certain circumstances it can be beneficial for a team to loose and also outright fraud attempts can happen. In Finland we had such an attempt of fraud in the *Pesäpallo* league just a few years back and the attempt is still being handled in courts today. In general, however, you can be assured that every team will do its best to win. In an online game like Hattrick this is a trickier question. The people playing are not professionals; they have their real lives to attend to in between the games.

In order for a game to be fair, both players must choose their teams starting line-up carefully and adjust the tactics according to the opponent. This takes time and real life responsibilities naturally take precedence over a game. Currently the Hattrick game engine selects a default line-up and uses a default tactic if the player does not do so before the start of the match. Since there are currently no real life stakes this is quite acceptable. As soon as it becomes possible for outsiders to bet money on the game, this, of course, is no longer an acceptable situation. In order to minimize such occurrences it will be necessary to control the people behind the teams that are eligible to become betting targets. The only teams participating in matches that are betting targets are teams from the highest national divisions. The persons behind these teams have to be contacted before each season; if they want to participate they will have to sign a contract in which they recognize the special rules and regulations that apply to betting target games. Since the idea is not to force anything upon the community, participation is voluntary. If you do not wish to participate you have the right to do so. Any person that chooses to refuse will still be able to play but his matches will not be possible betting targets. To encourage the players to participate they will be offered an incentive, some percentages of the total amount played on each game will be paid out to the players. Since money cannot be paid to players without them first providing the Hattrick personnel with a valid bank account, this bank account will also serve as an identifier of the real person behind the team.

The contract that has to be signed will stipulate that the player recognizes that he is responsible for declaring the line-up and tactics for each game that is to be a betting target some time ahead of the actual game. Of course the player will have the option to refuse a certain game from becoming a betting target, this if he knows he will be travelling or something similar on the day that the match is to take place. Due to this arrangement supervisors will be able to control that the players have entered their best line-up and a feasible tactic. If the line-up and tactic is not posted the outcome of the game will be decided by chance, this is how Veikkaus and other bookmakers handle matches that have to be postponed due to bad weather etc. when betting on real life games. A player that causes this situation and cannot offer a reasonable explanation why he did not post the line-up and tactics will be banned from participating in betting target games for some time. A player that causes many such occurrences could potentially be banned from the entire game.

4.4.3 Monitoring the matches

Fraud is an issue also in real life sports events; the *Pesäpallo* league scandal mentioned above is only the latest example of this in Finland. Internationally attempts are revealed each year. This could also be a serious issue in the Hattrick betting system. How do you protect yourself from two friends teaming up and settling between themselves that one player will change the tactics and line-up during the game in order to loose? This is no issue currently but as soon as money becomes involved one can rest assured that someone will try. Again this is an issue that you can address in the contract that each player has to sign, since this is a clear attempt of fraud, monetary consequences should follow from an attempt. Still there are always those who think they can beat the system. Because of this supervision of each game is needed.

The supervision issue is one where the community be leveraged. A few enthusiastic bystanders will most likely follow each game that is a betting target. These bystanders could be used as supervisors. In order to have the right to follow the game each community member would have to buy a *virtual* ticket. These tickets would be free and they would be used only to authenticate the people interested in watching the game. Out of the people who have bought tickets a sample will randomly be approached and asked to work as supervisors for the game. If they spot any irregularities they are to notify Hattrick personnel who then have the opportunity to investigate further. As compensation for services rendered, the supervisors could receive monetary donations to their Hattrick teams, in this way the supervision would not cost the Hattrick betting service any real money. Those betting targets that do not attract enough spectators to provide a large enough sample of supervisors will have to be supervised by Hattrick personnel. This scenario is a possibility when evaluating the possible gain that could be achieved from leveraging the community. These monetary gain would be most valuable the in case that the Hattrick organization themselves would like to provide a betting service. For the Hattrick organization any possible monetary benefit would be very important. For a professional betting provider having professionals monitor the games would probably not be as much of an issue, as they have more monetary power to leverage.

4.4.4 Setting the odds

Setting odds is another aspect where the knowledge in the community can be leveraged. The games that are to become betting targets will be announced on the forums and every registered player is then authorized to propose the odds that are appropriate according to him. The final odds will be decided as an average of all suggestions, provided that the sample is large enough. In the case of only a few answers the Hattrick organization must have the right to decide the odds itself. As the community directly affect the odds the community members feel empowered, and might perhaps also be more inclined to join in the betting as a consequence. The Hattrick organization can also save money since they do not have to allocate resources to come up with the odds for most matches.

A risk with allowing the community to set the odds is of course that a grouping could cooperate in order to change the odds in such a way that the grouping would gain an edge over other gamblers. This is why there must be a threshold for how many suggestions must be given before the community can be allowed to set the odds. The Hattrick game will of course also be responsible for checking the validity of the odds before they are made public.

4.4.5 Current betting on Hattrick

Towards the end of this study we noticed that Expekt [3; 9] has just recently begun offering betting on Hattrick games. Expekt is a large Internet bookmaker that until now only offered betting on traditional sporting events. As they are based in Malta they can avoid the monetary claims the state has on the traditional monopolies, and since it is a completely online venture they are also more cost effective than the traditional monopolies. As a consequence Expekt has been able to offer better odds than the traditional,

national, monopolies. Offering better odds has allowed them to rapidly gain a relatively large market share. Concerning Hattrick their business idea is quite similar to the one we presented above, offering odds betting on selected Hattrick games. We tried to contact Hattrick Sweden in order to get information on how the problem areas we discussed above have been solved by Expekt. Unfortunately we did not receive any answer from them before the deadline was upon us. As we were not able to contact any of the Hattrick personnel in order to discuss the Expect offer, we tried to evaluate their offer by trying it out. We expressly tried to evaluate their offer in light of the discussions on issues to be addressed presented above. The matches offered as betting targets are a few of the matches played in the highest divisions in Finland, Sweden and Norway each weak, in this regard they have chosen the same solution we introduced above. The betting system they offer is also traditional odds betting, so also in this regard they have come to the same conclusion as we on the betting format best suitable for online gambling.

We did not, however, find any evidence that Expekt, or Hattrick for that matter, are in any way supervising the matches being offered. The online survey we conducted on the Hattrick forum highlighted that many players are hesitant to bet real money because of concerns about managers not always posting competitive line-ups, for on reason or another. We even received a few answers that directly pointed out the possibility of a manager forgetting to post a line-up, or for some reason starting with a very odd line-up or tactic, as the reason for why they would not bet on Hattrick games. As far as we were able to deduct from studying Expect online, the company has started offering betting directly without addressing any of these concerns. This seems like a risky tactic since there are many open issues that need to be addressed before you can be certain that the matches are fair and valid as betting targets.

Expekt does not offer any information about the teams involved in the betting targets. This implies that the offer is targeted only at the Hattrick community, since in order to get any statistics you have to be involved in Hattrick. Surprisingly enough a very small percentage of Hattrick players seem to be aware of this offer. Since Expekt has only recently gone online with this offer you would expect them to try to and make themselves known within the community as quickly as possible. There was a banner ad within the Hattrick game for some time, but the marketing could have been more aggressive. We consider the market launch and early adaptation by the users to be a key issue for this kind of service.

Many of the players who answered the online survey told that they participate in Hattuvakio, which is a betting game developed by HT-Suomi. Every week six matches from divisions one to four are selected, and the players of the Hattuvakio game have to try and guess the winners of each game. One Hattuvakio round continues for one whole season. The player who anticipated the winner correctly the most times at the end of the season wins the supporter service for three months. The game seems to be popular because it involves no risk, but still gives the players the satisfaction of winning when their guess the right winner. When no real money is at stake, the risk of "bad management" by a manager is not an issue. This is exactly what many players commented. A somewhat standard answer was: "Betting on Hattrick games sounds interesting but since there is a risk of fraud, I would not bet real money in it. Hattuvakio is fun and riskless and therefore enough for me." [7, 8]

4.4.6 Veikkaus' attitude towards betting on simulated sports

In order to estimate the interest of Veikkaus for this kind of a project, we organized a mail interview with Aki Järvinen, MA. Since 2003 Aki Järvinen has been researching and designing games for Veikkaus and is also working on his Ph.D. "Games without Frontiers: The Aesthetics of Digital Games". The translated interview with Aki Järvinen is attached in Appendix 1.

We were mainly interested in what Veikkaus' attitude is towards serving as a bookmaker for virtually simulated games like Hattrick, and what kind of operational structures Veikkaus would require in order to be able to offer this service.

First we tried to discover how Veikkaus would ensure that the managers are reliable and can be trusted to try to win every match that is a betting target. We asked, that if we could assume that the teams in Hattrick that play in the highest Finnish league were betting targets, would it be possible for Veikkaus to financially support the managers of these, in order to ensure that they do their best? Otherwise there is a risk that some managers' interest in the game could decrease and they might leave the game in mid-season. According to Aki it is not realistic to think that Veikkaus would support managers financially in any way. The current legislation does not allow supporting players in this fashion. A manager dropping out is a part of the fantasy league game concept. Any support would be restricted to prototyping and research.

The second question concerned marketing. How to get people involved in new forms of online gambling, like e.g. betting on virtual simulated games. Aki answered that marketing and campaigning are of course necessary. From a legal aspect the concept is tricky. One option would be to run this game for PR

purposes, i.e. for free, without any betting. It could serve as a first contact to gambling online. On the other hand, trust and reputation are key issues and the leagues are not that well known as the leagues of the real world. Sports betting rely heavily on well-known teams and leagues.

We also wanted to know what Veikkaus would require from the game and the Hattrick technology. If Veikkaus was to participate in gambling with Hattrick teams, what are Veikkaus' requirements for the built-in random functions and the fairness of the game? How would Veikkaus set the odds for the games? Aki answered that Veikkaus would basically have to take responsibility for running the game and optimize the parameters affecting the results so that these would represent the factors of real football; injuries, penalties etc. With the odds Veikkaus would then control the winnings and profits of the game. The main principle of Veikkaus' business is that true randomness must determine the results. Knowledge of the football teams could prove useful but still randomness should be the key factor. This is why Veikkaus is not involved in lower divisions. Hattrick seems to be a game that would require not only a lot of effort but also some investments to make it a possible betting target. It would almost have to be run like a listed corporation in order to ensure fairness for all possible players and betters. On the other hand, some of the charm behind Hattrick and similar games is that it is free and without any demands.

How about virtual simulated football as a betting target? Is it a realistic target in the future? According to Aki the answer is no. Current gaming legislation quite effective at prohibiting any form of gambling on virtually simulated games. And as the whole concept is quite uncertain, with many loopholes, it is not a very attractive idea, at least not at the moment. The reliability of the system has to be absolute. Aki does not claim that such a system could never be possible, but at least not in the near future. For PR purposes it might be possible but would require a lot of marketing.

We asked what kinds of ways to cheat in Hattrick gambling were first to cross Aki's mind. Aki could think of a situation where a player has multiple teams and at some point plays against himself, and bets on the team he coaches to win. Another possibility is that several managers together optimize the power structure of the teams in their division and share the profits outside of the game.

As a conclusion it could be stated that at the moment Veikkaus is not interested in providing any services on betting on virtually simulated games. Also the legislation in Finland seems to interfere with such a service. If the problems could be worked around and a completely reliable and secure system could be established, Veikkaus might be interested in providing such a service in the future. This is though strongly speculative at the moment.

5 Conclusions and future research

Online betting is a constantly growing business; already relatively large amounts are traded on the net this way each year. Since there is currently an active betting service very similar to the one proposed here, it is clear that there is also interest in the business towards this kind of betting. Veikkaus seems to be overly sceptical about the legal obstacles towards such betting opportunities, as the study of current legislation showed the trend is that the gambling arena is becoming more and more open. State run monopolies like Veikkaus must be vary if they are to maintain their market share; new entrants into the field are currently looking at new business opportunities. This is highlighted by the fact that Expekt is already offering real betting on Hattrick games.

One weaknesses of Expekt's offer seems to be that they have neglected to harness the possibilities of the strong community surrounding Hattrick. In this paper we also highlighted some possible benefits that can be found from involving the community more intensively in the betting offer. Monetary gains can be made by empowering the community to set the odds, and by harnessing the interest within the community for the league by utilizing community members as supervisors. It is also likely that the group that first must be reached in order to make the betting offer a profitable business is the community member, after all they have already shown an interest in the game and are therefore more likely to be interested in a betting service than the general community. Empowering the community, by for example letting the community decide the odds, might be an interesting way to get the community involved in the actual betting.

There is however very little research available on how interested people actually are in this kind of gambling. This is an area that needs to be studied further. We also found no clear research about the legal aspects of gambling on these kinds of simulated sport events, the legal issues considered in this paper dealt with more traditional lotteries and gambling. Another aspect of that should be studied interest the general public to the possibility of gambling on a simulated league. In order to make a service like this a profitable business, it is not enough that only the people directly involved in the games participate in the betting. From the business perspective there should be an actual community of willing gamblers, much like the fans

of real life football leagues. Online gambling on simulated sport events is a very interesting proposition with good prospects in the future; further research and piloting projects are however needed before one can give any conclusive answer to the actual future value of such services.

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APPENDIX A

1) If we assume that the teams in Hattrick that play in the highest Finnsih league were betting targets, would it be possible for Veikkaus to financially support the managers of these, in order to ensure that they do their best? Otherwise there is a risk that some managers' interest in the game could decrease and they might leave the game in mid-season. Would some kind of co-operation contract be possible between the managers and Veikkaus?

"It is not realistic to think that Veikkaus would support the managers in any way. The current legislation does not allow supporting playing these kind of games. Managers dropping out is part of the fantasy league game concept. Any support would be restricted to prototyping and research. "

2) How do you get people involved in new forms of online gaming? Simply through marketing?

"Marketing and campaigning are of course necessary. From a legal aspect the concept is tricky. One option would be to run this game for PR purposes, i.e. for free without any betting. It would serve as a first contact to gambling online. On the other hand, trust and reputation are key issues and the leagues are not that well known as the leagues of the real world. Sports betting relies heavily on well known teams and leagues."

3) About the Hattrick technology: If Veikkaus was to participate in gambling with Hattrick teams, what are the Veikkaus' requirements for the built-in random functions and the fairness of the game? How would Veikkaus set the odds for the games?

"Veikkaus would basically have to take responsibility for running the game and optimize the parameters affecting the results so that these would represent the factors of real football; injuries, penalties etc. With

the odds Veikkaus would then control the winnings and profits of the game. The main principle of Veikkaus' business is that true randomness must determine the results. Knowledge of the football teams could prove useful but still randomness should be the key factor. This is why Veikkaus is not involved in lower divisions. Hattrick seems to be a game that would require not only a lot of effort but also some investments by a fairly small group to make it a possible betting target. It would almost have to be run like a listed corporation in order to ensure fairness for all possible players and betters. On the other hand, some of the charm behind Hattrick and similar games is that it is free and without any demands. "

4) Is this kind of a virtual football game a realistic betting target? Does Veikkaus have any rules that prohibit it from expanding into a market like Hattrick? Could the reliability Hattrick be a key issue?

"In practice no. The current gaming legislation prohibits gambling on virtual simulated games. We expect the reliability to be absolute, but as you pointed out, the concept on betting on simulated games has some uncertain issues. I don't claim that this could never be possible, but at least not in the near future. For PR purposes it might be possible but would require a lot of marketing."

5) Can you think of a way to cheat in gambling on Hattrick.

"I could think of a situation where a player has multiple teams and at some point plays against himself, and bets on the team he coaches to win. Or that several managers together optimize the power structure of the teams in their division and share the profits outside of the game."

Benefiting from Communities in Open Source Business

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Abstract

This report describes open source software communities and examines how they can benefit businesses built on open source. We investigate how open source projects have been commercialized, what kinds of business models have been used and how companies can benefit from open source communities. The case example is JBoss Inc., which is a worldwide organization dedicated to the professional servicing of JBoss technology. Their best known technology is the JBoss application server. With insights gained from the literature and the case, we highlight what is needed when companies start taking advantage of open source communities.

1 Introduction

Open source software communities (OSSC) are one of the most successful examples of collaboration and community building on the Internet today [1]. Open source communities have been researched in many ways. Researchers have probed the composition of open source communities, motivations to join them, and the way they communicate. Other researchers have investigated open source business models. But nobody has put the two strands together: there appears to be no research on the business use of open source communities.

To fill this gap, this report examines what must be taken into consideration when using communities in software business and particularly in developing software products. The research questions can be stated as follows:

- How do open source communities work with companies?
- What are the patterns of collaboration within successful open source communities and how should these patterns be taken into consideration when building a business around open source communities?

The report consists of five sections. Section 2 contains a literature survey of open source software communities. We will give the reader a description of the idea of open source, how communities are built up around it, what motivations there are to join open source communities, and what open source business models there are.

Our case study focuses on JBoss Inc., which is discussed in Section 3. JBoss is a worldwide organization dedicated to the professional servicing of JBoss technology. Their best known technology is the JBoss application server. We will introduce to the reader how community actually works around a real life company, how business can be carried out and what kinds of problems may occur.

In Section 4, we will give practical recommendations to companies that are going to use open source software communities in their business. We will present ten concrete recommendations that should be taken into consideration when commercializing open source software communities. The recommendations are based on the literature and on the JBoss case.

Finally, Section 5 concludes our report.

2 Open Source Software Communities

2.1 Open Source Software

Open source software products provide access to their source code. The source code is the heart of a software product and it defines the functionality of a software application. It is a collection of instructions, written by programmers in a programming language. In other words, source code is the software itself. Open source licenses generally provide that the code may be freely modified and redistributed. [1, 2]

Perhaps the most notable open source software products are the Linux operating system and the Apache Web server. Linux and Apache have given fairly good competition to closed-source vendors, especially Microsoft. In fact, Microsoft has felt greatly challenged by open source software, because many of the traditional ways of competing, such as price, do not apply to open source. Open source software has entailed a new way of thinking for software production. It is a new way to produce software products.

The idea of open source software is to make the source code available to everyone for free, which makes it possible for a large band of developers to work on the software product. Collaboration of developers creates communities spread around the world that produce high quality software products. Communities are discussed more in the next section.

2.2 Communities

Open source software is developed by communities. The communities are commonly loosely organized and operate very informally. There is no tight hierarchy, no formal positions and no delegation. Instead, the communities are built on the freedom to program and to share software with others. [1, 3]

Open source software communities are spread out all around the world [1]. Community members have usually never met face-to-face and yet share a strong sense of commitment. In the communities, software developers get advice, suggestions, contributions and even direct programming help to develop software better.

Because open source community participants come from all over the world, effective ways to communicate are needed. Typically, people use the following communication channels in online communities: chat rooms, discussion groups (bulletin boards and forums), private mailboxes, group e-mail management and instant messaging [4]. Open source communities use these communication channels, but may also use modern collaborative tools such as WikiWikiWeb. We will see an example of these tools in Section 3.

It may be a little surprising that open source communities can collaborate effectively to complete complex tasks. Without natural contact, without hierarchy and without tight project control, they can build high quality software. This is something that has been uncommon in the corporate world. Can open source software be developed in communities in a chaotic atmosphere without formal practices?

The answer to the previous question is twofold – yes and no. A community can be relatively huge but the truth is that there is a core part that actually develops most of the code. They are the so-called core developers, who serve as non-formal project leaders. The size of a core team is typically around ten active developers. In addition, there are contributors who help to develop the software product. The rest of the community can be classified as the user group. The problem of coordination is not huge because core teams are typically relatively small. They normally decide what can be taken into the releases and what cannot. The formality in an open source project increases over time – the bigger and more mature the project, the more formalized the way of working. [1, 5]

When an open source software project has started, the size of the community around it increases little by little. First the process is typically *ad hoc*. In this stage, someone has started to develop a piece of code just for fun. As time goes on, the size of the code base increases and if the project is attractive enough, it will gather contributors. The core team forms up and some formalization is needed to agree on some development practices and informal positions. In the community, position and status are earned by knowledge and skills. [1]

It has been shown that open source software products are not very often developed by a large community [5]. Instead, they are developed by a few core members (1–4 people) who act more like cavemen. They write the software alone without outsiders. Nevertheless, there are many significant communities around open source products and this report concentrates on those communities that have a reasonably active user and developer base.

2.3 People involved in communities

Who are the volunteers that develop open source software? Many surveys have been conducted to discover what kinds of people spend plenty of time on developing open source software products. Kim has gathered results from different surveys and he paints the following picture of the typical open source developer [1]:

- Male-dominated – 98% are men.
- Most developers come from Europe and the United States

- Relatively young people – Generation X – over 70% are between the ages of 22 and 37
- Participants are mostly experienced IT professionals
- Mostly college and high school graduates
- Part-time participation

On average, open source contributors have 11 years of programming experience. 28% have a Master's degree. Most contributors spend less than 20 hours per week on open source software. [6]

2.4 Motivations

What makes people develop open source software in communities in which only a few get money and most work is done for free? Obviously, the motivation does not seem to be money. What is it then? Just for fun? Actually, yes, much of the work is done just for fun.

The Boston Consulting Group conducted a survey called "The Boston Consulting Group Hacker Survey" [6], in which they investigated the characteristics of open source communities and what motivates people to join them as users, collaborators or developers. The top five overall hacker motivations are the following:

- Interest to take part in an intellectually stimulating project
- Zest to improve their skills
- Work functionality
- Code should be open – chance to work with open-source software
- Non-work functionality

Money plays a very small role and is almost a zero-level motivator in joining a community to develop open source software. The incentive and interest to join a community is something on a higher level. Programmers were found to be artistic ("Like composing poetry or music"). Many said that "This project is as (or most) creative as anything I have done". The researchers showed that contributors even lost track of time and that one of the biggest costs of participation was lack of sleep and reduction of social time. [6]

Although open source communities attract people, developers do not want to take part in whatever open source projects. Surveys paint a picture of the motivated developer who wants to create a product that is interesting [5].

How are developers attracted to a project? A community cannot live like an amoeba without goal setting and without someone who gives even loose directions to follow up. A good leader, like in any area of life, can attract, motivate and get people around him or her to achieve what is required. Kim writes that "the more active the leader is, the more active the community will become" [1]. A leader is not needed just to say what to do: in open source communities, a leader is a motor that motivates people with his or her example to take active roles in a project.

The leader and the core developers are also needed to keep up active communication within a community. Kim tells in his surveys about a few projects in which leaders' active communication in public forums was extremely necessary [1]. A leader has to be an example to others. Like we said before, members of a community are mostly volunteers and you cannot simply delegate tasks to them. You can do it indirectly, but first you have to earn your position and authority via example. You must show your intelligence and skills to develop high quality software. Kim writes: "If you yourself are not working hard, enthusiastically, and visibly, you will not attract others who will." [1]

2.5 Open Source Business Models

Most software business models rest on the notion of strong intellectual property protection and the vast majority of commercially available software is closed source software. This means that the actual source code is hidden from the public. This is because the source code is the core of any software product and many commercial companies want to control the software via source code.

Open source software represents an opposite stream. Open source software and especially the source code are freely available to evaluate, copy and modify. At least, apparently, everything is totally free and open.

Still the fact is that the vast majority of commercially available software is based on the closed source idea. And this reflects on the business models. It is natural to think that the most proper way to make money is to sell software products or licenses to the customer. In this way the customer gets the right to use the software for their own purposes.

In the open source business, however, the business models have to be formed in a different way compared to the closed software business. The difference to the closed source model is dramatic. In open source business, the idea is to give software for free and make money in other ways. For example, this could include giving support and development consultation to the customer.

Open source business models have been divided into the following categories [7]:

- Support and Service Sellers: You give away the software product for free and make money by selling distribution, branding and after-sale services.
- Loss Leader: You give away the code as a loss-leader and market positioner for closed software.
- Widget Frosting: For example, a hardware company embeds open source in their hardware products in order to get better drivers and interface tools more cheaply.
- Accessorizing: You sell accessories, books, compatible hardware, or complete systems with open-source software pre-installed.

The most frequently used open source business models have been the support and service seller model and the loss leader model [7]. It is usual that open source software products are given for free or as a loss-leader and the actual profits are gained from services provided for users or from complementary products. As we will see in Section 3, JBoss is a good example of a service and support seller.

2.6 License Models

Many times one may wonder why these people would want to give away their intellectual property and publish software as open source. Steve Lee compares the act of making source code publicly available equivalent to revealing the recipe for Coca-Cola and giving away a potential gold mine. [40]

One answer is that, like we said before, these people consider themselves to be in a community with a set of social norms telling that source code and information should be shared with both the community and the rest of the world.

Still, open source contributors want to somehow regulate open source software freedom. They want to put restrictions on how their code is handled. Usually, this is done through various types of open source licenses and this is a way to maintain the integrity of an open source project.

There are several well-known open source license models [40]:

1. The GNU GPL

The GNU GPL is probably the most well-known and used open source license. The GNU GPL can be classified as the strictest of the open source licenses because it attempts to prevent the licensee from establishing copyright or patent rights in the software. Everything that has been further developed from original GPL licensed software or has been mixed with another piece of software must be published under the GPL. This means that the code should be open for the community and the rest of the world. Perhaps the best-known example of GPL-licensed software is the Linux operating system.

2. Artistic License

The artistic license is very flexible and less restrictive compared to the GNU GPL. The idea behind the artistic license is to give some artistic rights and controls over the source code for original developers. In normal conditions, the Artistic License will not prohibit a licensee from claiming intellectual property over modifications to the licensed software.

The artistic license sets very few or no barriers at all for further development of the software. Source code can be mixed with another piece of code or developed further and it can be closed easily, too. The level of discretion is relatively high compared to the GNU GPL.

For example, the Perl programming language has been released under Artistic license.

3. BSD-style licenses

BSD-style licenses are probably the most widespread alternative to the favourite GNU GPL. Unlike the GNU GPL, BSD-style licenses give great latitude to mix closed and open source software without restrictions. Any modifications and further development is also allowed. In other words, anyone is allowed to do anything with the BSD licensed software.

The limitation is that original copyrights should be noted and credits have to be given to the developers and contributors where credit is due.

People who use BSD-style licenses are developers who want to keep low barriers or no barriers at all between the closed source world and open source software communities.

4. The Netscape Public License (NPL) and the Mozilla Public License (MozPL)

The NPL and MozPL were created when the source code for the Netscape and Mozilla web browsers was released publicly. Steve Lee says that the idea had been to balance the needs of commercial software developers with the call by the open source community to adopt a licensing approach that stays true to the definition of open source software [x].

The content of NPL and MozPL is that all further development source codes must be made publicly available to the community and rest of the world. NPL and MozPL are apparently closer to the GNU GPL than the Artistic or BSD-style licences. The essential idea is that developers have to give back their work to the community.

The difference is associated with integration of closed and open source software. Unlike GPL, the NPL and MozPL do not require that mixed code (closed software parts) be published under the NPL or MozPL.

The foremost incentive in NPL and MozPL is trying to fill the gap between the two extremes: GNU GPL and BSD-style licenses.

2.7 Attitudes to Commercialization

The community of open source software producers is frequently portrayed as being inimical to corporate profits that come directly or indirectly from open source products [2]. Developers of open source software have across the board been considered idealists who want to keep all software free and who regard commercialization as evil.

In fact, only a minority of open source community members are against commercialization. Surveys indicate that only ~10% can be compared to the communists who want to beat the marketing devil [6]. This 10% dislikes proprietary software, the companies that produce it, and wants to help the open source community defeat them.

Richard Stallman, the father of the free software concept, said recently at Linux Summit 2004 that free does not mean free of charge. The idea is that developers want to have access to the entire code, so that further development is possible and good ideas can be shared with others. It would be wrong to claim that most open source advocates oppose commercialization. Rather, they usually do not seek profit and want to keep software code available.

2.8 Benefits and Problems of Open Source Communities

How can communities benefit or harm a software product company? Here we have collected some important facts that you should take into consideration:

Advantages

- Software product robustness – with enough eyeballs, all bugs are shallow [2].
- Lower overhead – a company can outsource some of its code development to an open source community, paying for it in values less tangible than money. More complex software products can be done by smaller companies at a competitive cost [7].
- Support from a community – in many software companies, the level of support is fairly poor. With an open source community, customers can get support and answers from highly motivated people who are willing to answer fast and for free – in some cases, they can even fix your problem [2].

- Spread word about your product – the community can market the project on the Internet.
- Anchor the product to real-life demands – the community provides immediate feedback on what works and what does not and on what is needed and what is not.

Disadvantages

- Version proliferation – communities can create new versions of your product and in some cases, it is very difficult to identify the best version of the product [2].
- Lack of control – you cannot delegate tasks or force people to do just what you want.

Community-based development has many advantages. It will be unsuitable mainly in situations in which a lot of formality and control are required, for example in life-critical systems.

We now move on to analyze our case company, JBoss Inc. We will show how community actually works around a real life company and what kinds of problems may occur. As we will see, all the advantages and disadvantages listed above can be discerned in the case.

3 Case JBoss

3.1 The business

JBoss Inc. is a worldwide organization dedicated to the professional servicing of JBoss technology. The first JBoss technology was the JBoss application server. The JBoss application server is an open source product that implements Sun Microsystems' J2EE specification. The server makes it easier for developers to write complex networked applications. The company offers three types of services: support, training, and documentation [8].

Support. There are three types of support:

- Development support. The JBoss consultants answer questions both related to JBoss and your application generally. A 50-hour email-only support package costs 10,000 €.
- Production support. Includes a specified amount of development support, as well as an unlimited number of production-related questions. Production support is available in many editions. The least expensive only includes email support at a 24 hours guaranteed response time. This package costs 8,000 €. The most expensive package has unlimited support delivered by email, phone, and onsite, with a guaranteed 2 hours response time regardless of the time of the day.
- OEM/ISV support is meant for those who package and ship JBoss with their products.

Training. JBoss Inc. offers courses designed to give you the knowledge you need to make the most out of JBoss. The courses are held all around the world by JBoss contributors. The company's motto is: "Spend your money on knowledge not licenses." There are four public courses:

- Introduction to JBoss covers how to develop J2EE applications on JBoss.
- Advanced JBoss is a more intensive, theoretical and in-depth follow-on course for those with prior J2EE knowledge.
- JBoss Admin teaches systems administrators the ins and outs of running and administering JBoss.
- JBoss Hibernate teaches developers how to use the Hibernate object/relational mapping tool. Hibernate is a Java library that can be used with the JBoss application server.

In addition to these off-site courses, the company also conducts on-site training which can be one of the standard courses or the course can customized to the client's needs. The prices of the courses run from $1650 for a 2-day course to $3250 for 4-day courses.

Documentation. JBoss Group sells two e-books: *JBoss Administration and Development* explains the nuts and bolts of the application server and a separate book *JBoss Clustering* deals specifically with clustering features. The books cost $10 each to download. In addition, there is an option to purchase a subscription which gives you access to all the books and all future revisions for a limited time. A 12-month subscription costs $99 for a 1-user license or $500 for a site license.

JBoss Inc. has innovated in its service and product mix. They have shown that it is possible to make money out of open source. In February 2004, the company closed an oversubscribed $10 million round of venture financing with Matrix Partners and Accel [9]. This success would have not have happened without skilful utilization of communities. Indeed, the JBoss community has created the business. Section 3.2 describes the JBoss community. The symbiotic relationship of the company and the community is described in Section 3.3. Section 3.4 takes a look at how the company has nurtured its community. Section 3.5 then explores the various conflicts the company has experienced and how it has handled them. Section 3.6 concludes the case.

3.2 The community

JBoss, Inc. has created an active online community on their web site, jboss.org. On 21 April 2004 JBoss users had posted a total of 98,083 messages on the company's online forum [10]. There are also two mailing lists, a user list and a development list. The user list has been averaging more than 1,000 messages monthly [11], and the development list has been almost equally active [12].

Online forums and mailing lists are the bread and butter of online communities. Recently, JBoss has experimented with a few more exotic collaboration aids. The company maintains JBossWiki, a collection of web pages that any registered user can modify [13]. The idea of the wiki is to collaborate on documenting JBoss. At the time of writing, the wiki contained less than 50 articles, many of which had not been finished. Given that the company sells documentation for money, we wonder why they created the wiki in the first place.

Another collaboration aid used by the company is the blog. The JBoss blog features short technical pieces written by the most elite members of the community [14]. Others can read the blog and comment on existing articles. Because most articles have produced less than 10 replies, the blog appears to resemble traditional publishing instead of being a true collaborative tool. Nevertheless, the technical pieces contain useful information for members of the community and could bind the company and the community together.

3.3 Benefits of combining business and community

JBoss Inc. is a pure knowledge play. The company draws its employees from the JBoss development community. Community members can become employees after they have made significant contributions to the JBoss code base. As employees, they provide support, hold training sessions, and write documentation. Unlike in traditional companies, therefore, there is no clear division of labour between the support and development functions.

But the JBoss development community is not merely a source of employees. Not all development is done by paid contributors. In April 2004, there were 14 active core developers who were not affiliated with JBoss, Inc. [15] 21 core developers had retired. At least 75 other people had made non-trivial contributions. These contributions have improved the JBoss application server. Greater technical competitiveness increases market share, thereby creating a bigger market for support services. The company thus stands to benefit greatly from work by the community.

In addition to providing free research and development, community members also spread word about the product in other online communities. Members of the JBoss user community, for example, have been advocating the product in other Java development communities [16, 17]. This word of mouth, combined with marketing efforts by the company itself, has made JBoss one of the best-known brands in the Java application development space today.

Community members, even if they are not JBoss employees, also stand to gain from the JBoss community. In particular, they get free support from the community. On the online forum, support is mostly provided by other members of the community, but JBoss employees do post in the more interesting threads. Most questions get answered in less than a day [10].

Because online forums can be created without company involvement, free support cannot create unique value for the community in and of itself. To show the advantages of commercialization, JBoss argues that the paid contributors benefit the broader community [18]. With the money they get from JBoss, they can work full-time on improving the JBoss code base. This accelerates JBoss development, which benefits everyone.

Not everyone has bought this argument. It has been claimed that the paid contributors do so much consulting that they no longer have time to improve the code [19]. The policy of the company is to allocate

50% of their developers' time to coding JBoss and 50% to professional services [18]. If this policy were followed, development would indeed speed up. The slow progress of the JBoss 4.0 application server suggests that the company has not yet found the right balance in practice [19].

The legal relationship between the company and the community is governed by the LGPL license [39]. The LGPL allows modifications and redistribution of the program, but if a modified version is released, the modified source must be made public. The LPGL differs from the GPL in that it does not require the user of a library to release the source code of programs that merely link to the library. The license guarantees that all improvements to the JBoss code base will be shared with the community while preserving the integrity of closed source code that sits on top of JBoss. The LGPL also gives community members a right to fork JBoss.

3.4 Nurturing community at JBoss

The JBoss community revolves around one man: Marc Fleury. Fleury has defined what JBoss stands for today. He exemplifies the kind of effective peer leader we saw as important in Section 2. He started the project, coded key modules, marketed JBoss relentlessly on online forums, conceived the JBoss business model, founded JBoss Inc., and built the company up from scratch. Fleury possesses a rare combination of technical and marketing ability. He codes extremely well, but more importantly, he is a visionary. He saw the profit potential of the JBoss business model and executed on the idea. Moreover, he marketed the business model superbly, coining new concepts such as "Professional Open Source" to legitimize his ideas. There are few equivalents to the JBoss marketing machine in the open source world.

Fleury has been instrumental in nurturing the now vibrant JBoss community. One of his early ideas was to publish pictures of core contributors on the company's web site and display them prominently on every page [15]. This boosted the core contributors' esteem within the community. Fleury's action can be analyzed in terms of Maslow's hierarchy of needs [20]. Maslow proposed that people have five different needs: physiological, safety, love, esteem, and self-actualization. Physiological needs are the first to be satisfied; self-actualization needs are the last. Once each of these needs has been satisfied, a person moves to satisfy the needs at the next level. What Fleury shrewdly recognized was that a picture posted on a web site will satisfy esteem needs (to achieve, to be competent, and to gain approval and recognition). Because most open source contributors lie on the highest levels of Maslow's hierarchy, this kind of recognition no doubt created value for them.

Fleury has also tapped to the self-actualization needs of developers. He has promoted the Professional Open Source concept as a new way of life different to and better than "boring" corporate development [18]. He portrays JBoss as a harbinger of a new future in which money is not made of licenses but services. "Invest in people not in empty licenses." [21] He likes to compare the JBoss team to a band of fiery rebels, "30 people taking on the industry" [18]. Underlying all this is a sense of excitement, being part of something truly important and ground-breaking, boldly going where no man has gone before. The community has loved it.

The prospect of financial reward motivates community members to contribute. Fleury has shrewdly hyped the financial rewards to being a JBoss Group employee. In addition to the 50-50 development and services model, the company distributes options and has an annual profit-sharing plan. Fleury claims the level of income can be high:

> Whether the JBoss open source business model sustains Ferraris or VWs for its sales people remains to be seen, but one thing is clear. I must be incredibly crazy not to be in the "peace of mind" business, right? I will be soon. Professional Open Source offers a business model where the successful contributors to the project have the option of joining the business and eventually earning a living comparable to that of partners at large law, consulting and accounting firms. And that's good enough for me. [18]

Promises of this kind probably draw ambitious people to the JBoss community.

In addition to marketing the project within the community, Fleury has sought to increase the size of the community through traditional PR channels. He has given numerous interviews [22, 23], appeared at conferences [24, 25], and authored technical and business-related articles [26, 27]. These actions have built up press coverage and brand recognition. Fleury notes the importance of the brand as follows: "Brand is one of the few things you can sell in the open source realm." [18] The brand also draws people to the JBoss community and creates a sense of identification within the community.

The leadership of Marc Fleury has indeed been decisive in building the JBoss community. Although many of Fleury's innovations can be copied, the large JBoss community presents an entry barrier to potential competitors. Even if a competitor achieved technical parity with JBoss, it would need a JBoss-sized community to win market share. But if there is only technical parity, no one will switch. The JBoss community thus provides JBoss competitive protection.

3.5 Conflict around the JBoss community

The business model devised by Fleury was novel and unsurprisingly has generated plenty of discussion. The concept of Professional Open Source has been criticized from two angles: for some, open source developers are naïve idealists who give away their work for free; for others, asking money for open source software is capitalist exploitation [18]. Further, the aggressiveness of key JBoss figures has created resentment in some circles. In this section we try to illuminate the kind of conflicts that commercialization can create in communities. We first study attitudes towards JBoss and then examine one specific case of conflict: booting Core Developer Network members from the JBoss code repository.

Few open source products have aroused emotions like JBoss. JBoss threads on online Java forums tend to produce vigorous activity [28, 29, 30]. Argumentation in the threads often appeals to emotions. JBoss is a hotly debated topic in the Java blog space, and bloggers usually have a clear opinion either for or against the product [31]. The project has not lacked human drama either, with high-profile people joining and leaving not always on friendly terms [32]. Former JBoss employees who have turned bitter enemies of the company sometimes contribute to threads on Java forums [33].

What could explain these conflicting feelings? Part of the conflict is inevitably due to jealousy. There are those who cannot accept that others have started to make money out of open source. On the other hand, some people have taken issue with the JBoss attitude. They scoff at Fleury's publicly stated objective of "ubiquity, domination across all spheres" [18]. They accuse JBoss of naïve idealism or point out the deleterious effect that free products have on IT industry revenues [34].

In the final analysis, this kind of polarization has probably strengthened rather than weakened the JBoss community. The members of the community are converts, and as all politicians know, a common enemy – in this case, JBoss detractors – strengthens the will of the people. Fights between JBoss fans and critics have also drawn attention to the product and improved its brand recognition.

That said, not all conflict is productive. Sometimes it can hurt the company. A case in point is a mass exodus that a group of JBoss employees staged on 4 June 2003. Apparently unsatisfied with their compensation deal, seven JBoss consultants left the company and formed a competing consultancy, Core Developers Network (CDN) [34]. The ensuing reaction by JBoss Group and the Java community illustrate the difficulties that commercialization can bring about.

After CDN announced its departure, pundits started wondering whether Marc Fleury would kick Core Developers Network out of the JBoss project [34]. Fleury controlled the code repository, after all, and was probably not happy that former employees had just founded a competitor to his company. Indeed, CDN was given the boot in early August 2003 [35]. Their access rights to the code repository were removed, so that they could no longer update the product.

JBoss officials justified their action with two reasons [36]. They claimed that CDN members had refused to participate on public forums. More important, they had created a competing project, which would lead to irreconcilable conflicts of interest. We will not try to cover the ensuing debate about these points. We merely note the commercial interest behind the decision. One of the CDN members stated: "It appears that getting control over just the trademark and CVS write access can be used to build a very good control mechanism over an open source community. This can be used to build a near monopoly on commercial services sold for that project and distribution of those benefits." [37] This point was not lost on Fleury, who had earlier commented:

> I also believe there's a monopolistic opportunity in open source infrastructure, just like Microsoft has a monopoly on the desktop. Free software will create a market that is much more open than that, but we see ourselves becoming a standard, used everywhere, while other application server vendors are struggling. That's our end goal, to become a monopolistic but responsible provider of Web infrastructure. [37]

Thus it would be at least reasonable to claim that here is a case in which commercialization affected the community in a controversial way. Because CDN members had done nothing contrary to the interests of the JBoss project, JBoss Group's conflict of interest claim was disputed. If there was no conflict of interest,

the company used its economic interests to justify an action that slowed down JBoss development. This would have harmed the community.

A thread on the popular Java forum theserverside.com illustrates the range of community reactions to the CDN split [34]. There was open jubilation: finally the company got what it deserved. There was speculation about the motives of the CDN members to leave JBoss Group. Disagreement on profit sharing was quickly identified as the most likely culprit. One person wrote: "It was never going to work, esp with the head honchos raking in all the moolah. Kinda counter-intuitive in a community run project, don't you think?" Many people were clearly satisfied with the company's difficulties.

Debate raged on whether the JBoss/CDN split would benefit or harm the project. It was claimed that CDN would create more exposure to the project, more production deployment, more unbiased, objective consulting, better support, and maybe even better documentation. Others claimed that the JBoss/CDN split demonstrated why open source applications cannot be used in serious production deployments. According to this argument, open source consultancies have too much uncertainty to be depended upon. The merits of moving to commercial servers were hotly debated.

The issue of control was raised several times. Most people seemed to lean in favour of a voting system to decide who has access to the code repository. But it was noted that Marc Fleury controlled the repository, and many suggested, considering the nature of the man, that he would not tolerate the CDN in the code repository for long.

Developers had differing opinions about the future of JBoss Group. An article in *The Inquirer* had hinted that "JBoss is going to have a tough fight on their hands here in the States" [38]. Some bought and others disputed this argument. One JBoss client wrote that their contacts at the company had already been updated and that they were still happy with the service.

JBoss employees made only two posts on the thread. Both posts were written by Ben Sabrin, Director of Business Development at JBoss. The first post was a carefully constructed PR message that tried to play down the impact of the CDN split. Sabrin wrote: "We regret the departure of three of our US consultants, however this sort of thing happens every day in the services industry. With JBoss Group, it is business as usual. Our customers will continue to receive the highest quality of service that they have come to expect from JBoss Group." In response to derogatory comments, however, Sabrin later lost his composure:

> Cary Bloom please learn the meaning of the world professionalism. Of the CDN only Dain Sunstrom and David Jencks made any significant contribution to the JBoss code base. Those are the two, taking the inquirer as the gospel is like relying on the The Star of the National Inquirer for your news. [34]

This outburst created no goodwill in the thread. Sabrin wisely refrained from further comment.

This thread points out how new open source based business still is. Many people have negative attitudes towards commercialization and draw satisfaction from the difficulties of a company. Arguing with these cynics is pointless. The hope is that over time, if the concept of Professional Open Source establishes itself, the number of critics will gradually diminish.

The thread illustrates that the issue of control has not been fully settled in open source communities. Many community members apparently would prefer a voting system to decide on who is granted access to the code repository. But this can work against the commercial interests of a company, who would like to create monopoly profits out of the code base it controls. There seems to be no easy way to resolve this conflict. But if a company decides to exercise its control, it should at least try to justify its actions as convincingly as possible. Because most members of open source communities are intelligent individuals, bluff will not do.

The thread further demonstrates how communities can create uncertainty about the future of a company. Uncertainty is bad for business, so companies should play down the effects of dramatic events. The initial post by Ben Sabrin had this effect; unfortunately, Sabrin later lost his composure. There will always be aggressive individuals in open source communities who hide behind a screen nickname and post disparaging comments about other posters. Company representatives should simply ignore these individuals and trust the persuasiveness of their messages.

3.6 JBoss conclusions

JBoss has created a balanced business model around JBoss technology. The company is mainly a support seller but also generates some supplementary income from accessorizing (selling documentation). The company and the JBoss community live in a symbiotic relationship. The existence of either would not be

possible without the other. On the one hand, Marc Fleury has nurtured the community like his baby. On the other, Fleury's business would not have flown without efforts by the community to create the JBoss application server. Above all, the case illustrates the importance of strong peer leadership: much of JBoss' success can be attributed to Fleury's technical and marketing genius.

4 Recommendations

The literature study in Section 2 and the JBoss case in Section 3 have numerous implications for companies that want to create vibrant communities and nurture them. In the following, we present ten concrete recommendations that these companies should keep in mind as they build businesses around open source communities.

Recruit an effective peer leader. The leader is maybe the most important single factor behind successful open source communities. The leader can motivate others to join up and invest time in the community's project. Motivation is crucial because open source development is based on freedom. The effective peer leader imparts his excitement on others and makes them develop high-quality software. The leader uses soft leadership skills to inspire others to eagerly invest time in the project, rather than tough management skills to delegate tasks to others. As a project grows, some formalization of roles may be needed, but the leader tries to avoid unnecessary formality and instead encourages creative problem solving.

Satisfy developers' esteem needs. Developers strive for achievement. They want to feel competent and gain approval and recognition. The project should satisfy this need. JBoss, for example, recognizes its developers by posting their faces prominently on its web site. Other psychological tools could be used to the same effect. The project could collect statistics on the number of posts individuals make or the number of lines they contribute. The Top-10 for each metric would then be prominently displayed on the project's web site. The project leader should consistently thank developers for their efforts on mailing lists and public forums. In addition, community members could vote every month for the outstanding contributor of the month, who would then get an award.

Provide opportunities for self-actualization. Open source contributors lie on the highest levels of Maslow's hierarchy of needs. They want to feel that what they are doing is important, meaningful and valued. At JBoss, Marc Fleury has successfully tapped to the self-actualization needs of developers by promoting Professional Open Source as a new, better way of life. Project leaders at a company should communicate why the work the community is doing is different. They should show the community that it is participating in something truly unprecedented. They should create challenging problems for community members to solve. And they should include sexy technologies in the project to let developers improve their skills.

Draw employees from the community. It might sound a little bit cliquish, but the fact is that it is better to recruit developers from a community than outside of it. First, the community trusts its own members much more than outsiders. When your employees are trusted, the whole community will give better support to your commercialization tendencies. Without trust, they may leave the community and give their contributions to someone else. Second, by drawing talent from the community, a company can recruit developers that it knows beforehand. It can evaluate how good they are at developing software at no cost. It can then aggressively hone in on the best talent.

Decide how access to the code repository is controlled. The company should be able to determine who is granted and denied access to the code repository. But the company must decide how it uses its power. Who will be given write access to the repository and under which circumstances can such access be revoked? After the JBoss/CDN split discussed in Section 3, developers have become more aware of the importance of control. Autocratic control will create distrust and possibly code forks. On the other hand, sometimes the commercial interests of the company must be protected by giving somebody the boot. To manage expectations, a company should publish a clear policy that states how access to the code repository is controlled.

Manage conflict. A company should expect and prepare for scepticism about its business model. The community around its project will always contain a fair share of critics. The company should react to scepticism with positive messages that reinforce the beliefs of converts. In no case should company representatives participate in flame wars.

Build a community before others. If you are fast enough, you can capture markets before others. Rapid moves are important in business but especially important in the open source business. The pool of talent is limited and naturally the first project in a given market niche is more likely to attract the best developers

and contributors to it. And the bigger the size of a community, the bigger entry barrier you have against competitors. People in a community are not so interested in moving to competing projects, first because of the time that they have invested in a community's products and second because they may feel socially attached to their current community.

Do not forget traditional PR channels. It is no longer enough to create an online web site and hope that they will come. So many open source projects compete for developers' attention that effective PR is required. Marc Fleury contributed to the size of the JBoss community by giving numerous interviews, appearing at conferences, and authoring technical and business-related articles. These actions built up press coverage and brand recognition. A well-known brand draws people to the community and furthermore creates a sense of identification within the community.

Keep operations transparent. Open source software development is based on freedom and sharing information with others. You can carry on a business but it must be done in a transparent way. You cannot make profitable business by deceiving people for long. Community members, your employees and customers should be informed about your doings. It must be made clear how you make money with open source software products and how you get benefits from a community. Especially important is to inform others how you benefit them. After all, the logic of a collaboration model must be made clear in a way that everyone understands.

Make sure the community benefits from the company just as the company benefits from the community. As we noted before, the company can benefit community members by employing them. But there are other ways as well. The company's business leadership can provide direction to the community and make the products it creates more useful for everyone. The company can hand out cash prizes to valued community members even if they are not employees of the company. It can host real-life community meetings. It can sponsor trips to conferences for the best contributors of the year. It can build a more professional web site for the project. It can share some of its profits with the community. The possibilities are endless.

If you follow these 10 recommendations, we hope your experience with open source communities will be that much more pleasant.

5 Conclusion

In this paper, we investigated how open source communities can be made to work with business. Although business based on open source is still in its infancy, it is clear that companies can build a profitable business around open source communities. Companies benefit from communities in many ways. Communities provide free research and development, spread word about the company's product, support the product for free on online forums, and help the company address real-life needs better. In addition, a large community can present a formidable entry barrier to potential competitors.

To shed light on the nature of open source communities, we first conducted a literature survey. The survey revealed the importance of leadership in informal communities. It showed what kinds of people join open source communities and what motivates them to join the communities. In addition, it studied how people in open source communities communicate.

After the literature survey, we developed further insight into building thriving open source communities by examining the JBoss case. The company has created a large open source community around the JBoss application server. It has designed a novel business strategy that takes advantage of the community and executed on it superbly. The actions of the company will probably set a role model for others to follow as they strive to build successful open source businesses.

The literature survey and the JBoss case guided us when we unveiled 10 recommendations that companies aiming to build businesses around open source communities should follow. We hope that these recommendations will enhance the way companies build and interact with open source communities.

Innovative companies need not fear open source. They can embrace it. If they start now, they can be in the market before competitors. Marc Fleury writes: "The Internet and Open Source make it possible to produce software cheaply and distribute it at zero cost. The larger macro-economic trend of commoditized software is here to stay." [18] If Fleury is right, service-intensive open source businesses will thrive. In that case, it might well be as Fleury claims: "Soon, one day, we will all walk through walls. Not just me, everybody." [18]

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LOSING WEIGHT VIRTUALLY - FINNISH COMMUNITIES ON THE WWW

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Abstract

This study investigates Finnish weight losing communities on the Internet. It seeks to identify different business models that are applied on the online services provided by the weight-loss industry. Business models are categorized to five service classes: traditional, virtual, multi-channel, support to actual business, voluntary maintained weight-loss services. From each class, one site is selected as best of the breed. These are further analysed to gain understanding of the services provided and technologies used to build online communities. The current online markets in Finland for weight-loss services are found quite moderate, but the number of discussion groups available indicates a huge need for services.

1 Weight Losing Business

In year 2002, 55% of Finnish men and 37% of Finnish women had overweight. In total, this means some 32 million kilos of extra fat. Hundred of thousands of Finns are trying to lose weight daily. When these numbers are converted into currency, the figures are impressive. For example, diseases caused by overweight require treatments that costs yearly approximately 150-540 million euros. This is more than the costs of diseases caused by tobacco and this is in Finland only. [10]

In United States, where obesity is considered to cause national crisis, the retail sales of weight-loss products is nearly 4.5 Billion dollars. Moreover, it is estimated to nearly double by the year 2008. [20]

Dieting is a business, which is heavily tight to the cultural aspects of human life. In current society, thinness is highly evaluated when compared to earlier times. For example, there was a Finnish saying stating that two things a man should be proud of are the length of his beard and the obesity of his wife. Nowadays, nobody uses it.

Rather, a weight-control lifestyle is promoted. Usually this includes both "healthy" nutrition and regular exercise. The weight control programs can be categorised depending on the theory behind into behaviour therapy, cognitive intervention, social support programs and pure nutrition education. Behaviour therapy concentrates on changing the daily eating habits, and cognitive intervention techniques try to adjust person's thoughts about eating and herself. Social support programs focus on involving family, relatives and friends into a weight-control program. [8]

Nevertheless, as most of us are deluded with quick and easy, the market of weight-loss industry is filled with "wonder" products. For weight-loss products and services, it is quite typical that same kinds of products appear on certain periods. Pertti Mustajoki differentiates five classes: [14]

1. *Weight control* – life style to be applied for rest of the life
2. *Diet* – change of living habits to be followed on the short period and it is targeted to lose weight quickly
3. *Fiber concentrates and tablets* – the product contains fiber in order to fill the stomach
4. *Fat-burning and loose-weight products* – products which normally have no scientific proof of effectiveness
5. *Wonder products* – products which have no connection to the energy balance of the human body

In addition to above, there are

6. *Medicines that help in weight control* – on the market, there are two medicines with proven effects on the weight-control

1.1 Operators and Earning Models

From the list above, one can figure out the some of operators on the weight-loss industry. The biggest market share belongs to the food and beverage manufacturers: as 42 % of American households use some low-fat product, no dieting or weight-loss product sales can come near to the same results on the money terms. In addition to low-fat food, there are also markets for low-carb and low-sugar products. [20]

Examples of different diets [20]

- Weight Watchers
- The Pritikin Diet
- The Scarsdale Diet
- The Ornish Diet
- Jenny Craig
- Slim-Fast
- Raw Foods Diets
- Macrobiotic Diets
- The Eat Right For Your Type Plan
- The Shape Up! Plan
- Celebrity Endorsements
- The Low-Carb Diet(s)
- The Eskimo Diet
- The Stone Age Diet
- Atkins: The Low-Carb Lifestyle
- The Zone Diet
- The South Beach Diet
- The Carbohydrate Addict's Diet
- The Diet Cure
- The Fat Flush Plan
- The Go Diet
- The Insulin Control Diet
- The Insulin Resistance Diet
- The Life Without Bread Diet
- The Neanderthin Diet
- The Protein Power Diet
- The Sugar Busters Diet
- The New "Net Carb"

Manufacturing and selling the actual weight-loss products is of course a way of benefiting from the weight-control culture. Not only the manufacturers of "wonder" products exist on the sector, also big pharmaceutical companies are investing on the research of obesity and on commercial applications of the resulting products.

In addition, selling the services related to weight controlling can be a good business. Weight Watchers is not the only service provider on the market, as several other firms are also offering their services. The government and municipal authorities are also offering services in Finland, but often only to really fat people. Private medical reception centres organize courses and private counselling to persons interested in losing weight.

In Finland, the unions have actively promoting so-called TYKY (Työkyky) courses to their members and they have networked with several hotels and spas. As many companies are ready to invest on the well-being of the workers, a profitable business can emerge with this model.

A very recent trend in Finland is to have a personal trainer to help in losing weight and getting fit. Several fitness centres provide these services in addition to more traditional fitness services, which are promoted as a part of a healthy life style.

Marketing of diets is an art form in itself, and it is one of the sure ways of making money out of weight-loss business. Dieting advertisement is likely to make huge promises, and use woman body as an illustration [10].

Publishing sector has taken their share of the money. For example, search on Helsinki region library system Helmet reveals 257 references on the term "laihdutus" (lose weight). Amazon.com holds 2126 titles under subject "weight loss". Aikakausilehtien liitto (Finnish Periodical Publishers' Association) lists 10 magazines that are targeted to women interested in health, fitness and weight control. Television has only recently started to show series on weight-losing projects of real persons.

1.2 Weight-Loss Services

Mostly weight-loss services offer support and information. The services are often in the form of the course or regular meetings, and group lessons are well established in business. Private counselling is also offered on some extent.

Localisation of the information is quite critical in success of a business. Weight is considered as a very personal matter, and people prefer to use their mother language. In addition, the sentiment of foods in the market and eating habits vary from country to country. For example, rye bread is not a commonplace food in United States as it is in Finland.

Even though only person herself can affect her weight, weight-loss services are offered and bought in big scale. In order to understand why people buy these services, the benefits and disadvantages of programs are discussed.

The benefits of weight loss groups compared to private counselling are

- Various guidance methods can be used

- Person can learn from the experiences of the others
- Support from other group members
- New friendships can be established
- Can be fun
- More economical than private counselling

The negative side of the group sessions is that there needs to be a strict agenda and that the instructor skills needs to concentrate more on how to present the message in a way that it is suitable for all group members. In addition, no individual problems can be assessed on the group sessions and there are persons who are not suitable / interested in losing weight as a part of a community. [14]

For an effective weight-loss program, components from behaviour therapy, cognitive intervention, social support programs and nutrition information should be included in order to lasting change the daily behaviour [8].

2 Aims, Objectives and Methodology

The present study seeks to identify different business models that are applied on the online services provided by the weight-loss industry in Finland. In addition, the community features used on such sites are evaluated. The objectives are:

1. Identify the sites providing online weight-loss services in Finland
2. Categorize the business models and select the cases for closer study
3. Analyse the scope, community features provided, quality of services, and business models of the selected sites
4. Make cross-analysis of the case studies.

The initial population of the sites was found via selecting first two hundred references from Google, the search engine that gave most results to the search criteria, and categorizing the resulting pages (see Figure 1). A number of link collections were explored to determine whether any significant sites had been missed. Of the all sites found, five were selected in order to cover the main categories. In addition, one service provider of discussion group was selected as a reference point.

The sites were accessed several times during the research period (one month). In order to ensure systematic and consistent evaluation, an evaluation assessment form was produced, mainly based on the criteria used in other studies [13], on the lectures of the course [18], and on a method on evaluating the business model [1].

The information items about the sites were categorized as:

- General: purpose of the site, site address and target audience
- Business idea: name of the company, financial information, description of business idea, and main benefits of the site to the company
- Site – information content: scope, structure, relevance, authority of the writers, accuracy, frequency of updates, usage of humour
- Site – community features: availability of chat, discussion groups, e-mail newsletter, ability to pose questions to experts, online comments, electronic notice boards, mailing lists, online voting, competitions/quizzes, user surveys, private counselling, private messages, multi-channel support, contribution to story/feature development
- Site – general features: registration, personalization of site layout, email interaction with site providers, online trading, online video demos, online helpdesk, prices of the services
- Users: gender, age, experience of computer usage, how one can become a member, how often the site is visited, benefits and obligations for the user, connections to other communities

The service providers were also contacted, and some information was obtained directly from Kutri.net. Others were either too busy to answer or there were difficulties in finding correct addresses.

3 Online Services

As it is claimed that hundred of thousands Finns are trying to lose weight every day [15], the subject does exist in the Web as well as in physical world. For example, a search on Google with the word "laihdutus" (lose weight) results approximately 10,700 target pages. The result set contains discussion groups provided by different providers, articles, weight-loss products and services, fitness tips as well as a few recipes. In addition of these serious pages, a few containing humour related to weight was found.

Most online services are providing only information about benefits of losing weight and tips on how to do it. Subjects of the information on sites can be divided into following categories:

- Weight-loss programs
- Disadvantages of obesity and health in general
- Motivation
- Success stories
- Nutrition
- Recipes
- Fitness in general
- Fitness exercises
- Link collections
- Products related to losing weight

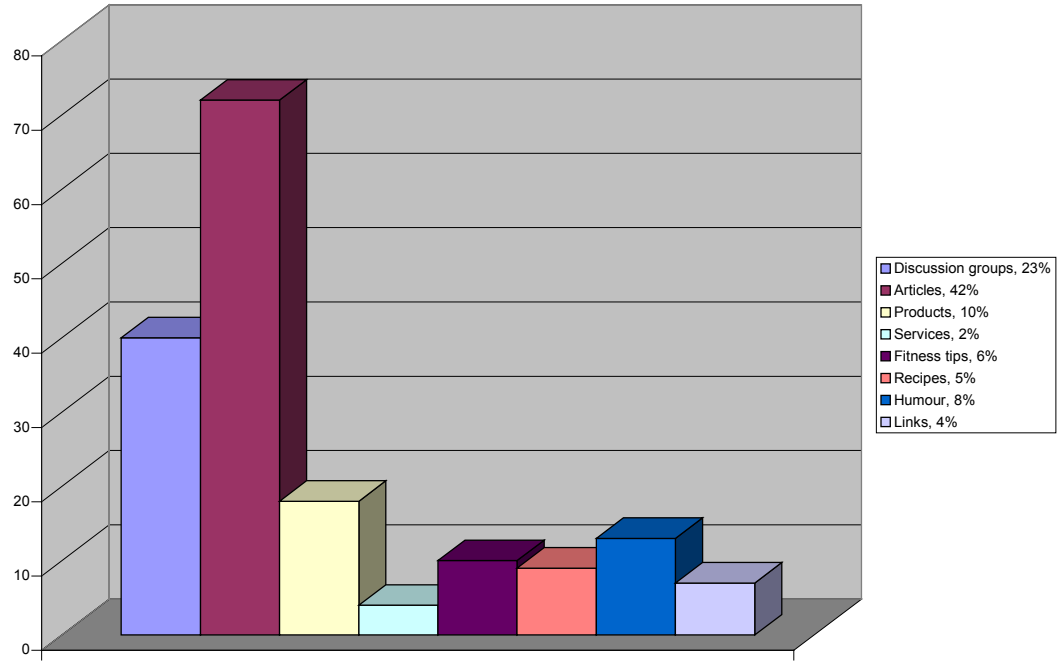

Figure 1. Google results categorized by content

In community building, discussion groups seem to play an important role as they enable support from other people to a dieter. As in all communities, there seems to be an own language for a group that is used by the insiders in the discussion. Sometimes intruders, mainly men, participate into discussion with an item that is not relevant to the group but rather related to intruder's opinion of women and how women should behave and look.

3.1 The Categorization of the Business Models

Very few sites even try to make business with their online services, and especially the community features seem to exist only to support and to market the core business in physical world.

The same operators appear on the online market as on the physical market. Publishers, private medical reception centres and of course, weight-control firms offer or at least market their services in the Web. However, voluntary weight-loss groups and individual weight-loss projects are not revealed to public in physical world, but in online world, they form a significant part of the sites.

The business models can be described with following categories:

- Traditional weight-loss services - weight-loss services and related products are offered in physical world
- Virtual weight-loss services - same as above but only on virtual world
- Multi-channel weight-loss services - the customer can access services via multiple media
- Voluntary maintained services - for example, personal weight loss projects are published on the web and there are other services as well
- Support to actual business - company's income source is something else than weight-loss related services or products, but as its customers or target audience is interested in weight losing, the services are offered in the site in order to generate traffic

First 200 Google results were examined for their business model. The figure 2 lists the results of this examination.

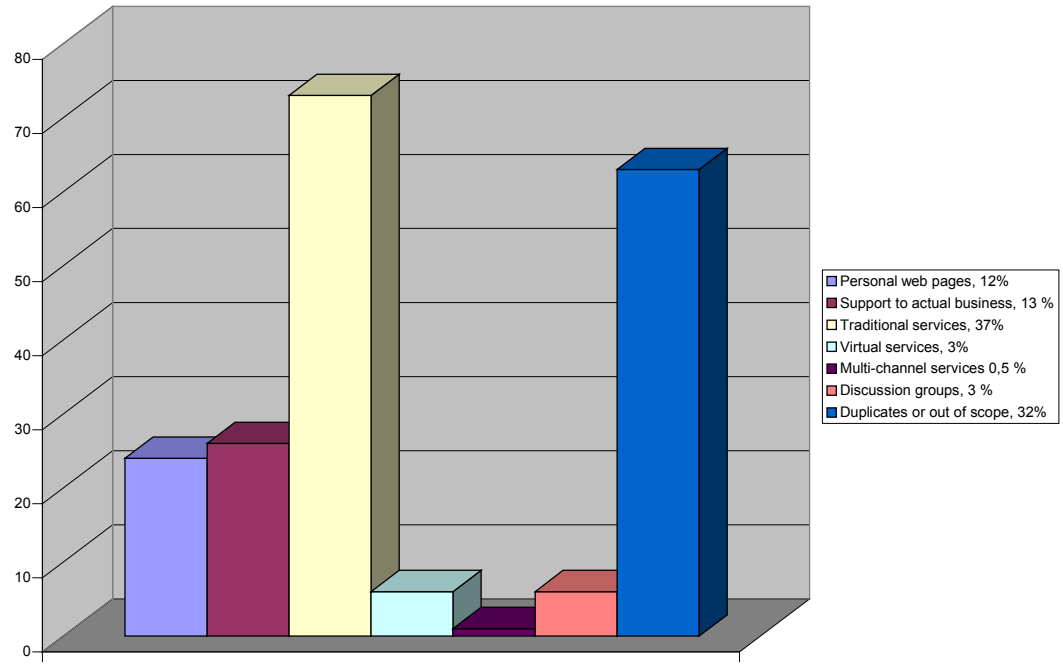

Figure 2. Google results categorized by business model

3.2 Example Community: Terhi.net

An example of service is Terhi Net, a discussion group to everybody interested in losing weight. The site contains mainly discussion groups, but a weight losing support group services are also provided.

In general, the site is not very well maintained, but the community was selected as an example of the user behaviour as the statistics of the discussion groups and the users were readily available. As the business case of the company was somewhat dubious, it was not selected as actual case study; the only income sources seem to be advertising and small fees on the persons attending the groups.

There were 3172 messages in 16 different categories. Of the categories, five was nearly not in use: selling used garments and other products has not flown at all even though advertising is free.

1429 users have registered to the site, but only 222 of them have written to the discussion groups (15 %). Top Ten writers were responsible of 1025 messages, which make 32 % of all messages. Only 4, 6 % of the registered users have written more than ten messages.

20 % of the users have joined within five months, but there were no information available when the site has started. Only 18 users had created their own home page, and people tend to leave quite much of the personal information away from the published information. The user's ages differ from 18 to 50 years.

The site offers also ability to chat, but during the visits to the site, there were no discussions going on and approximately one or zero registered users were logged on at the time. There were very few visitors browsing the site during the researcher's visits. [19]

4 Critical Appraisal of Sample Communities

Five online sites were further explored. The sites were selected to present best of the breed on each business model category presented in Chapter 3.1.

- Painonvartijat - Traditional weight-loss service
- Mammadietti – Virtual weight-loss service
- Weight Balance - Multi-channel service combined with private counselling
- Helmi - Support to actual business
- Kutri.net - Voluntary maintained service

4.1 Painonvartijat (Weight Watchers)

4.1.1 Overview and Business Idea

Weight Watchers is the best-known company in the whole weight-control industry and only one with real global coverage. A subsidiary was founded to Finland in October 1975. Tens of thousands people lose weight with help of Painonvartijat every year: the peak periods are in January and in August, In January, there are approximately 25 000 customers compared to some 4000 customers in the summer time. [15]

Weight Watcher's traditional program consists of materials and group meetings. Meetings are arranged weekly in over 300 locations in Finland. The guidance is given either in Painonvartijat-groups, with postal course (95 €), via CD-ROM (50€) or with help of MP5 material (75€). The last one is targeted to men. Courses are organised also for the companies who want to support their workers weight-loss projects. [15]

A week in Painonvartijat's meetings costs 10, 60 euros and starting charge is 28, 60€. The service is marketed exhaustively, and there are often special offers available. In addition, the customer can get discount on buying a certain period in advance, and a guarantee is given about losing 3 kilos in four weeks if the customer follows the instructions. Sales of complementary material are adding to the profits a nice share. The company makes co-operation with food industry to introduce low-fat products to the market, and with publishing sector to create cookbooks and a magazine with the Painonvartijat brand.

The turnover was 8, 6 million euros and profit was 0,353 million euros in year 2002. There were a drop in the turnover and profits compared to year 2001, when the same figures were 8, 9 m€ and 0,974 m€. The company was categorized to class, in which the number of employees is between 200 and 499. [16]

4.1.2 Scope

The www.painonvartijat.fi site mainly exists for marketing purposes: it contains latest offers, explanations of different products and services, and timetables of traditional groups. To both support current customers and to get new ones, nearly 20 success stories are available, a couple of recipes are presented and a discussion group and Questions and answers section are provided. As the nutrition is in the core of Weight Watchers program, no references to fitness exist. Quite understandable links to other services are not provided, unless a link to MP5 marketing material is counted as such. [14]

MP5 section forms an independent part of the site and it is targeted only to men. It is the only of its kind in providing separate discussion groups for males. Other material on site is general marketing material for MP5 program. The discussion group is not very active, the number of all messages in fewer than 100, which is moderate when compared to number of messages in general groups. [14]

People who work in Painonvartijat-groups have been going trough same dieting process in their past. So leaders can better understand users and encourage them more because leader has undergone herself the

same experience. Also all the material is checked with the persons with formal degree on the nutrition. [14]

The site is concise and well structured. The overall image is very professional and neat. There are also the press releases of Painonvartijat. The content is mostly static so there is no need for regular updates, and no personnel are commenting in the discussion groups. [14]

4.1.3 Community Features

The business of Painonvartijat is based on the idea of weekly, physical group meetings where the customer steps on the scale and gets information and motivation for the next week. The site does not provide these functionalities at all, but the users of the discussion group have formed groups themselves and some of the groups even have homepages on the Web. One such group, Pajunkissat, had 179 members and they had set to themselves a 16-week period to lose weight.

The discussion groups are very active: during one day, there might be more than 60 messages and during March, over 30 threads were discussed in one category. The discussion is separated into five categories: uncategorized, questions and answers (by users), the results, food, and successes. As no statistics were available, the numbers are only rough estimates.

4.1.4 Users

Even though most of the dieters on Painonvartijat are female, all healthy people are welcomed to join Painonvartijat. If users are continuous medication or has special diet, they should first talk issue with doctor. One condition to be able to join Painonvartijat is that the weight in start must be at least + 5 kg more than a person having body-mass index 20. For girls between 10 to 16 years and boys between 10 to 18 years, a doctor must define the target weight. Pregnant women and children under age 10 are not allowed to diet in Painonvartijat. [14]

According to Painonvartijat's website, all kinds of people participates Painonvartijat and its meetings. Majority of users want to lose 7-20 kilograms but there is always a few starting with greater overweight. [14] Painonvartijat is the only one of the cases studied in this paper, which offers special instructions for men willing to lose weight.

4.1.5 Sustainability

Painonvartijat program is one of the most popular ways to lose weight in Finland. The firm is professionally managed with support from the Weight Watcher's international organization and likely to exist for a long period in the market.

CD-Rom is the way Weight Watcher's admit that the computers have come into lives of people. Adding Internet based service to their service portfolio might bring new customers, but there might be a fear of cannibalising the old, well running business.

Also, adding new features like homepages for customers to their site might improve the satisfaction of the customers, but the question remains whether it would be profitable. Adding more content to MP5 section might encourage the males to join as members, but also more marketing might do help in attracting customers, as it is unlikely that males would find the site only through www.painonvartijat.fi.

4.2 Mammadietti

4.2.1 Overview and Business Idea

Mammadietti's site offers virtual group meetings and instructions for weight losing. Their program consist different parts; postal course, virtual group meetings and virtual trainer, and these different parts can be combined together to an entity. Possible entities are:

- E-mail course (costs 22 e/8 weeks),
- E-mail course + virtual meetings (32 e/8 weeks),
- Email course + virtual trainer (130 e/ 8 weeks),
- Virtual group (15 euros), and
- Virtual trainer offers users personal support, advices and help on their dieting project. Virtual trainer costs 16 euro / question or 20 euros for two weeks.

The material can also be obtained through ordinary mail for an extra fee and the site sells advertising space. [11]

The service is produced by Auer Media, which is privately owned business name. From the legal form of the company, one can guess that there are not that many workers in addition to the owner and the business is quite small; the owner uses it as a framework of other business activities like consulting and training. [2]

4.2.2 Scope

Mammadietti claims that it's virtually diet-centre offers users' many-sided program, which helps them to lose weight and control their weight, according their individual needs. The program is based on the idea of daily 1200 calories per person and the focus is on nutrition; you can find a quite large-scale cookbook from the site, for example. Exercises are only small part of the program, and special instructions are given only to subscribers - except on how to add motion to the daily life. Links are provided to literature and there is a place for link list – with no content. There are only two success stories: the author's and non-specified person who managed to get her tummy into shape. No references to other methods or any motivation why one should lose weight is provided.

It is possible to access site without paying or registration. You are also allowed to read discussion but not to participate in it. The subscribers are give access to personal page, which contains more material about the weight-control and ability to follow the progress of the personal project. [11]

The image of the site is something between general weight-control site and marketing material for the services. The structure is quite oblivious, but one can get lost in the space on the search for specific information. The layout is clear, but it does not follow exactly same guidelines in all pages and there are some empty slots behind the links.

The overall feeling about the site is quite professional. The updates seem to be a bit hazardous on the static content, but changing parts are at least working.

There is background information of the author and how the program was developed. The author has no formal degrees on the subject, but long practical experience. As the name of the program, Mammadietti, suggests, it was developed after the author had gained weight when she was pregnant. [11]

4.2.3 Community Features

Mammadietti offers quite many community features, as in central of their business and action are discussion groups. They also have virtual trainer. There are currently three virtual groups for users from which to choose. Two out of three groups is meant for the people who want to lose 5 kg or more. One is for "heavy-weight classers", people who want to lose at least 20 kg. This division was made because users wished for it. The amount of participants of groups is limited to 10-30 people at same time. When users have joined to the group, they are allowed to participate as long they like and are active in the group. [11]

The object of groups is to discuss with other people who are in same situation, tell how you have proceed and what your feelings are. Of course, telling to another people encourages try more and that way it can lead to better results. Once a week groups have a compulsory week meeting. The purpose is that users leave their personal message at least once a week. It is allowed and recommended to attend groups also in other days. [11]

Virtual trainer gives users answers to their personal questions about losing weight, food, exercise and other relative issues. The idea of virtual trainer is to be personal support person for user. Users can contact personal trainer by email weekly or when they feel to. [11]

4.2.4 Users

Target audience is female, and at least all users on virtual meeting groups have done profiles of female. The site also provides special information for women who are breast-feeding their babies. The majority of users have children and they have put on weight while pregnant. The name of the program might partially cause the user profiles, but having children is not mandatory requirement to join to the group. [11]

Groups have 64 users (maximum user amount is currently 90), 53 users have children and 12 users do not have. The only condition to join groups is that you have to be over 18. The average age of users in all discussion groups is 30 and the age varies from 21 to 52. All three groups have almost same amount of users. First group contains 250 messages, second 500 and the "heavy-weight classers" group contains 500 messages.

4.2.5 Sustainability

As seen in examination of 200 weight-loss websites, only 3 percent of them included virtual services. Mammadietti was one of the first in this business and has a certain target group to which it has specialized and which definitively is likely to be more interested in weight-loss service than females in general. From that point, the business should be on good grounds.

However, the impression from the site is that the author has lost some of her interest into it and that she is concentrating on other businesses. This has probably resulted that there is not as many groups on the site as there used to be a year back. As no financial data is available it is hard to say whether this have had an impact on profits.

4.3 Weight Balance

4.3.1 Overview and Business Idea

Weight Balance is a new type of weight-control program: the interaction with instructor is taking place through either mobile phone or Web site. The idea is that users contact Weight Balance system via SMS or Internet every day and they get instructions about food and fitness back from the system. The system acts as a private counsellor for a person trying to lose weight. In addition, an observation program is available for those who have reached their target weight. Weight-control program costs 49-69 euros depending on how much user wants to lose weight. Mobile and observation programs cost extra (29 - 39 euro). [21]

Technology differentiates Weight Balance from most of the other companies in business. This is quite understandable as technology is the core business of GeraCap Invia Oy, the producer of the service. Its main offering is the platform that enables combination of different communication methods. On top of this platform, the company has developed several different products in addition to Weight Balance system: BarReader & Wireless Barcode Platform, remote monitoring system for transformer stations and SMSBeat, which is a service enabling a whole range of SMS based competitions, voting, and surveys. [4]

The Weight Balance system is developed together with the health care institute of the Kuopio University and it was published in year 2001. [21] The company employed maximum of two persons in year 2002, but it seems to use several freelance experts to answer the questions of the customers. The turnover class for the company is between 0-199 000 euros, so it is not that big business. However, these figures are a bit misleading as the company belongs to GeraCap Group, which employs 150 persons and have seven offices around Finland. [5]

4.3.2 Scope

Weight Balance has developed their own weight-control methodology, which focus on the balance between energy consumption and nutrition. The appearance and the material about the program are very concise, but in a way, a bit complicated. Technical terms are used in describing the program together with diagrams and tables. The structure of the information is straightforward without many internal links and the layout of the site is quite ordinary but working.

The site has an obvious goal as being the main marketing material for the Weight Balance program. Nearly all the information is targeted on ensuring the visitor that s/he can lose weight with the program. The program has been studied in Kuopio University with proven results; in preliminary study 3, 9 kilos were lost in average by the persons participating in program. [21]

Overview of site is practical and only necessary information is available. Style of the site is not to use any humour at all, but only to list the facts of the Weight Balance program. No references to other methods are done, but there is a link list to other sites providing general information about obesity. There are no actual training programs on the site, but a buyer gets a personal recommendation from the system. There are no recipes, only general information of the nutrition. The success stories are shortest possible: only nicknames and kilograms lost of those who have given the permission. There is no motivation for those considering if they would like to start a program, but two interactive sheets, which give you, free reports on what Weight Balance program would mean in your case.

4.3.3 Community Features

As the main idea of the service is not a group dieting but private counselling, the only community feature on the site is discussion group. All people are welcome to join discussion as no registration is needed to participate. Discussion group is not categorized and the users discuss issues related Weight Balance system and losing weight in general.

Discussion seems to be quite active, but there are fewer participants than in other services. As no statistics were available, the following figures are only estimates. There are 1290 threads in the discussion group since June 2001. Within 88 messages written in February -March 2004, there were approximately 20 nicknames participating in discussion.

Communication with Weight Balance system does not give the feeling of getting that kind of support as user could feel in the community and that is not the target of the system. However, the users seem to try to get the feeling of community in the discussion group: there are challenges posed in the threads as well as support for members – in success and disappointments.

Weight Balance publishes top ten lists of weight losers. Lists tell how has lost most weight but it is volunteer to take part of it. Weight Balance says that lists are updated in real-time.

Weight Balance site offers helpdesk, which work by email or SMS. It is possible to give feedback also by email or SMS or web form. However, no answer was obtained when questions regarding this study was sent to the given email address, and there were similar worries about getting help on the discussion group.

4.3.4 Users

Nearly all participants in discussion groups are female, if the nicknames can be used as a clue to the gender. In the top 10- lists are looked at, there are a few male nicknames as well, and considering that the site has quite "technical" image, it could be more targeted to both women and men than at least Helmi or Mammadietti.

4.3.5 Sustainability

Weight Balances multi-channel technique seems to be quite different from other diet companies' techniques. As seen above, first 200 websites from Google's search were examined and Weight Balance was only one that used multi-channel technique.

Another Finnish company has exploited the concept of private counselling from Web as well; Weight Wise offers also ability to order personal weight loss program from the Web, but no daily interaction is included to their program. Adding even more content (recipes, fitness tips etc.) to daily messages on the Internet would probably tie in the customers even better.

Multi-channel technique gives flexibly to users and nowadays people are busy; flexible and less time consuming techniques are required also in losing weight. The results of the users might improve if company would also offer more community type of services together with current private counselling. Also, the simplification of terms and ordering the pages on the site to motivate people to weight losing might help in persuading more users to the service. [12]

Costs to the users are quite high (29-68 euros/month). Potential users can hesitate to pay so much of the product because they cannot know exactly what they are buying. One way to advertise the Weight Balance program and increase people's willingness to pay is to give the users opportunity to test the program free.

4.4 Helmi

4.4.1 Overview and Business Idea

Helmi is a general site targeted to women, and Alma Media has set it up, which is one of the biggest publishing houses in Finland. Helmi is not a business as such to Alma Media, rather it is seen as a marketing media and they are trying to keep the market share of the Internet audience for the future profits. Multi-channel publishing techniques and processes are tested when Helmi personnel produce the site, newspaper and radio materials. The advertising covers some of the expenses, but Helmi is not profitable as a business. [18]

Helmi has been divided in ten or more sections, which handle issues like human relationships, looks, the well-being, sixth sense and horoscope. In the present study, the focus is on the discussion group and material on well-being section ("Hyvä olo"). [7]

4.4.2 Scope

The goal of Helmi is obviously to entertain people. The scope of virtual weight losing group is to be support group in which users can share feelings. There is no program specified, but the participants can use whatever method they choose to lose weight.

Helmi provides articles of different sides of weight-control, and it is provided by a publishing house, the focus is on the news and timely information about weight control and other issues related to well being of woman. This news approach dictates that there is no deep information of any subject, but the subject is covered broadly. For example, there are approximately 25 articles about weight-control, and energy tables of most common foods, but there is no proper instructions how you should eat based on the information on the table. There is a form which calculates your daily energy needs, but it is very simply when compared for example to the form provided by Weight Balance. The site contains information about the disadvantages of obesity and dieting, which are not covered in other services as much. There is no link lists as the goal is to keep the readers on the site.

Journalists write the articles and information is quoted as presented by the sources. There are no personal opinions in the articles, which make them in a way impersonal, and the reader is left to do the conclusions themselves.

The discussion groups have a different layout and felling when compared to the article section. Issues in discussion groups include; news of day, religion, sixth sense, human relationships, wedding, singles, virtual group (weight), good feeling - trainer, sex & erotic, beauty & health. There are no experts to answer to questions, so all kinds of opinions flow freely in the discussion.

The layout of Helmi site in general is messy. Site contains so such different kind of material that it is not an easy job to find information out of it or get insight what the site includes. The image of the site is like one of women magazines, which discuss of the equality of women and men in one article, and the next issue handles how you should polish your home.

4.4.3 Community Features

Helmi is trying to offer its members a feeling of community: the main goal is to attract regular visitors. There are many different interaction ways and community features: discussion groups, chats and private chats, competitions, and tests. The competitions offer some real prizes. Allowing users to apply themselves or their friends to actions of Helmi club generates more personal and interactive feeling of the service. In addition, a club letter is sent to all who have registered to the service.

At the moment Helmi's weight-lost discussion group contains 530 messages about 79 different issues. Together all Helmi's discussion groups include 8282 messages. The most popular discussion groups are news (2503 messages), human relationships (2404), sex (1320) and religion (1158). After these comes virtual group (weight losing).

4.4.4 Users

Discussion groups and Helmi in general are targeted for woman over 16 years. Because of this target group, also men are very interested of them. The selection of mysticism and sex as topics on the service will alienate some of the possible users, but the persons interested in them might be more probable to become regular visitors.

The statistics of the users is not available on the site, but it was manually counted that in March, there were 215 messages from 45 nicknames.

4.4.5 Sustainability

Helmi's site seems to be quite popular, for example, discussion groups contained 8282 messages. The target group is quite big, and its Internet usage is growing. Helmi has a different approach to other sites in offering weight-control information, so it can be successful in gathering members in the future as well.

The overall functionality of the site is somewhat confusing with different logins and nicknames on different sections. Improving it might help on keeping users come back.

4.5 Kutri.net

4.5.1 Overview and Business Idea

The purpose of Kutri.net was to support Katri Manninen's own fitness project during the year 2003. The site provides general information about weight-control, different tools and discussion groups in addition to reports of author's own project year. Kutri.net argues that its site is the most popular private weight-losing site in Finland and thousands people visit it every week. [9]

Kutri.net is an example of voluntary maintained site, and it can be accessed free of charge. There is no commercial interest behind the site, and it aims to just encourage and help people in losing weight. However, author of the Kutri.net's site, Katri Manninen, has participated in writing a book about healthy lifestyle. The site is not used as an actual advertisement media, but the success of it has definitively boosted the sales of the book. In addition, the author has been invited to hold weight-loss courses based on the ideas presented on the site. The author sees that the site has had small effect as such, but rather been as a hobby for her. [12]

4.5.2 Scope

Kutri.net holds articles about most of the subject categories mentioned in chapter 3. Author's weight-loss program ("kutraus") is presented, and its relationship to other programs and diets is discussed. Health and disadvantages of obesity are not discussed in detail, but the focus is on the motivation and mental side of lifestyle change. The only success story presented is the author's. Her guidelines cover much of how to eat, what to eat, when to eat, but not that many recipes are given. Fitness is discussed in detail, but only author's training program is given. The site provides author's opinions about several weight-loss products and services, and gives a few links to the sites that the author considers as relevant.

The content is mostly in the form of essays: they reflect heavily author's opinions on different subjects related to losing weight. Pictures are included only in few places. No other media formats are used, but there are a few excel-sheets and JavaScript-tools to help users to calculate their daily nutrition needs etc. The structure and layout are quite clear and the links are valid ones.

Kutri.net was established 2001 but sites were mostly written during year 2002-2003. In November 2002, the diary was started and Katri Manninen is still writing it. Discussion group was established in Christmas 2002 when Katri Manninen got her web site domain as a present. [9]

Being writer-scriptwriter, Katri Manninen's profession is all about writing text, and this can be seen on the amount and quality of the text on the site. She has not graduated on the weight-loss subject, but has tried to lose weight for 15 years with several methods. Last year's project was finally a success as she used a lot of time to examine all kinds of material related to the subject and was able to reach the goals she set to herself.

The author is not regally updating the information anymore. Some updates are still made but in general, she writes only to the diary and discussion groups. [9]

4.5.3 Community Features

Kutri.net offers much more information than community features, which is due to the nature of the site. Discussion group is the only way to interact with other people. Discussion groups are implemented with the same software as in Terhi.net, so user lists are available on the same manner and private messages to the registered users can be sent.

Topics in discussion groups cover Kutri's announcements of her progress, questions, evaluations of site and suggestions. Question section includes discussion about food, exercise, diet and other issues.

Presently Kutri.net has 520 registered users and discussion group contain 4740 messages. Kutri.net have recorded that they have had 47 online users at the best. Approximately 13 % of users have taken part of discussion more than ten times, twelve have participated more than fifty times and six more than hundred times. Top Ten writers were responsible of 1315 messages, which make 28 % of all messages. Nine of users have given their homepage to publish on Kutri.net.

Compared to Terhi.net Kutri.net has less registered users and less categories but more messages in discussion. In Kutri.net, top ten writers have written 28% of all messages. Same figure in Terhi.net is 32%. From this, it can be estimated that Kutri.net has more active users than Terhi.net.

4.5.4 Users

The users of the site seem to be mostly females who are interested in health in general and losing weight. This insight comes when reading discussion, but that of course covers only those users who participate into discussion. The author estimates that most of the visitors are between 20 to 30 years, the oldest being 50 years. [12]

Reading discussion and other articles needs no registration but taking part of discussion does. There is only one restriction concerning registration; users must be over 13, but there is no way to control that.

4.5.5 Sustainability

The future of Kutri.net seems to be quite uncertain. There are no direct profits coming in from the site, and the project for which it was founded has ended, it is questionable how long the site will be maintained.

In order to keep the information about the latest knowledge in weight losing up to date, the community could be included in content creation. Of course, this would require constant supervision about the quality of the material provided, and as the site is more like author's hobby than a business, it remains an open question if she is ready to open the content creation to others.

5 Cross-Community Analysis and Conclusions

5.1 Scope

Each site has its own character, and this is shown on the topics and features provided on the site. Table 1 summarizes the topics related to weight-control covered on the sites. Amount of plus-marks describe how well feature in question is supported. Minus-mark means that website in question does not have that feature at all.

Four out of five sites examined have their own weight-loss program. They are all based on the idea of healthy lifestyle. The differences are in the ways in which one should implement this lifestyle: calculating calories (Kutri.net) or "points" (Painonvartijat), relating eating to what you have eaten before (Weight Balance) or using predefined menus for a day (Mammadietti).

Nutrition is the most popular subject on articles; motivation and success stories are covered in nearly all sites. Actual training programs are quite rare even though most of the sites encourage the users to start regular exercising.

Three sites out of five explored are to market the actual products of the company, and persuade the readers to become paying customers. This has the impact on the scope of the free materials on the site: they are quite limited both in coverage and in depth. More material is then available after paying, either online or by other means.

There is often no formal training behind the information available on the web about weight control. Three of five sites presented had no formally trained experts as authors. This is not to say that the information is not correct on those sites, but it is more left to reader evaluate the correctness of the site.

Table 1. Summary of the topics covered on the sites

Topics covered on sites	Kutri	Weight Balance	Mammadietti	Helmi	Painonvartijat
Weight-loss programs	Own	Own	Own	-	Own
Disadvantages of obesity and health in general	+	-	-	++	+
Motivation	+++	-	++	-	++
Success stories	+	++	+	-	+++
Nutrition	+++	++	++	+	+
Recipes	-	-	+++	-	++
Fitness in general	+++	+	+	+	-
Training programs	+	-	-	-	-
Link collections	+	-	-	-	-
Additional products related to losing weight	+	-	-	-	+

5.2 Community Features and Other Activities

One feature seems to create the core of community features on the weight-control sites. The discussion groups are available on all sites selected to the study, and there exists several other sites, which contain

discussion on the same topics. This seems to indicate that discussion groups fulfil the need for group support among dieters quite well.

It would be easy to companies to collect success stories from successful weight losers but very few have done so. This is quite surprising, as these stories would act as a perfect marketing material: In that way, company would have "evidence" that its method works. In addition, stories would create feeling that is more personal on the site. Adding stories of persons who had just started dieting would tie at least these individuals more tightly to the site and be fun to read for those who just consider starting.

Other content from community could be obtained from community members in a similar manner. Of course, this would require constant supervision about the quality of the material provided by the community, but it would ease the maintenance job and bring a lot of new material on the site.

Other community features like chat were rarely used, even when they were available. This would suggest that there is either no real need for person-to-person communication or it is done with all-purpose tools like email. Posing questions to experts is not actively promoted on most of the sites, and there are no electronic newsletters for members. It seems like the current services has been brought to new media without fully realizing the full potential of it.

In general, computer-mediated communication is having positive effects on the nutrition education. [6] The area is very vaguely studied, and several open questions would need further research. For example, the users of the sites might have very different views on the communities presented here.

5.3 Users

Females were target group in all examined sites. Only Painonvartijat had a program, which was targeted to men (MP5). However, there are variations on focus of female audience, and these variations are shown on the total concepts on the sites. Nevertheless, it seems like the situation, which Susan Aubach described already in the 70´s: "Fat is a feminist issue." – Even on the online world.

5.4 Online Weight-loss Services as Business

Companies providing these services were either small, or provided the service as small addition to their actual business. They did not have realized the potential of selling additional products on their site, and only two-sold advertising space. Very little background information about the companies is available on the sites, and even the email addresses given on the contact pages were not working ones in each case.

Table 2. Examples of minimum and maximum prices of services

Prices of services available on the net	Min	Max
Kutri.net	-	-
Weight Balance	29	68
Mammadietti	15	130
Helmi	-	-
Painonvartijat	50	95

Prices of companies' weight losing program varied a lot depending on the customer selections. In table 2, examples of minimum and maximum prices of actual services (or products in the case of Painonvartijat) that were available for online purchasing. The comparison of prices is difficult as the usage periods vary as well as the features.

In general, it seems that many potential users hesitate to pay so much dieting activities in Internet. Over 100 euros in month is quite much if you are not sure what you will get. One way to overcome this problem would be to give users a test period to try the program. Another problem concerning the cost is that the most users of Internet are used to that everything in Internet is free or cheap.

5.5 Conclusions

Two of the cases provided free services, and two were very small businesses. The biggest operator on the market (Painonvartijat) did not sell their services online, only their products. This indicates that the market

of online weight-loss business is still a small one and it is not likely to grow quickly. However, the activity of discussion on Painonvartijat site indicates that having a well-established brand would also help in creating successful online business in weight-control industry as in other industries.

There might be a new business opportunity for a personalized online service that would combine the group support with individual guidance. What is not available on the current services is a workbook for a dieter. The workbook could contain weekly or daily tasks related to motivation, recording the weight, question forms of the daily nutrition habits etc. These workbooks could be for the individual only, or s/he could to discuss about her/his answers with an expert for an extra fee.

Motivation is the key to the successful weight-loss. On the sites, there is quite little information about how to keep up the motivation or descriptions of mental tools (like affirmation and visualization). Adding this kind of exercises to workbook described above would probably tie in the customers as well as enhance their results.

New technical products like heart rate monitors allow new business models if it is found profitable to integrate all training and nutrition information to one website. Having mobile phone to remind about training activities would also help in keeping the motivation up. For example, Nokia has already implemented such service (called "Personal Trainer").

Providing individual guidance over the net might also attract potential customers, which are not served on most of the services: the males. Men are not very likely to join groups or even discuss about dieting in public, but the interest in the subject is certainly there. This would require tailoring the services to more practical and concise. The males are more likely to be interested in exercising, so adding this kind of information to the sites would probably draw more male customers.

Social support might be another way of attracting more customers from males. For example, if two accounts would be offered at the prize of one for couples, the female might persuade her man to participate. This would also enhance the results as well as tie the customers in for longer time.

The number of discussion groups and free services related to weight-control is enormous. In current market, the support function to actual business seems to be the best business option, as attracting paying customers is a hard task in virtual world. However, there is a huge demand for the information, counselling and communities on the subject, but commercializing the need requires new business ideas and added value that can be offered only through new media channels.

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Dealer – A Mobile Game Concept

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Abstract

Mobile gaming is quickly moving from being the hobby of a few enthusiasts to becoming a whole new area of entertainment and thus big business. On the other hand, gaming communities and community-based games have been around for some time. Combining these two concepts brings many new exciting possibilities.

Dealer is a fictional mobile location-based game. The main idea of Dealer is to trade with other players and complete missions in order to achieve power inside the game. The aim of this study is to find out how a game could function so that it would combine the elements of multiplaying, location positioning, mobility, real-time events and a strong community. The second aim was to see if Dealer would have any business potential.

The study starts with background information from three different sources: a location-based "game" (Geocaching), a mobile, multiplayer game (Mogi) and online multiplayer community games. After this the game concept of Dealer is built using the background information. Finally the business potential of Dealer is analyzed using a business road test as the framework. This includes market and industry analyses.

The game concept of Dealer was explored on a reasonably superficial level. The basic gameplay, rules and roles of the players were devised. The game was not tested in any way, but the concept seemed plausible enough. Lessons learned from the background study were integrated into the game concept. These included making the playability as simple and fun as possible, tying in the community strongly to the development of the game and emphasizing comparative charts such as Top-ten lists of the most successful players and teams.

The results of the business analysis were that the market for mobile games is growing strongly all over the world, but a small games developer needs to choose their position in the value chain of the mobile game business very carefully. The financial estimates reveal that with a certain customer base the business of developing and running Dealer could be profitable. The biggest costs came from personnel costs and the income comes from player subscription fees and advertisers.

The conclusions from the results above are that Dealer is an interesting idea for a game and it has potential to function if implemented for real. The different elements that were combined produced quite a unique idea and similar games existing today are hard to find. On the financial side it was obvious that the initially chosen target city of Helsinki did not have enough mobile players in 2004 to support Dealer in its intended form. If Dealer would be implemented it would have to be done in a bigger market or at a later date when the market size has grown.

1 Background Information

1.1 Geocaching Community Analysis

1.1.1 Introduction

The Geocaching sport was first started around year 2000 in the United States when the US government removed restrictions from the GPS and even commodity GPS devices started to offer more detailed positioning data. Nowadays the sport is intended for anyone with a GPS device and willingness to go hunt the caches. The game has gained wide popularity among the GPS-owning upper middle class all around the world. Although the on a global scale the sport is still heavily US-based, e.g. the Finnish community is rapidly growing.

The Geocaching.com is owned by a company called Groundspeak Inc. Joining the community is free, but paying a small fee you will get a premium member status that gives you some minor benefits to your caching hobby. Groundspeak doesn't make enough with its membership subscriptions to support the site, so it is trying to make business by selling supplementary products and GPS devices for the geocachers.

The community is vital and the discussion in the forums is open and mostly concentrated on the different fields of geocaching. The forums and the sport itself do not seem to be suffering from vandalism. That is mainly because of the high initial cost of purchasing the GPS device, which heavily limits the installed base of customers. In the future this is will likely change as the common mobile devices start of offer location services that of are comparable quality to the ones offered by GPS.

1.1.2 Field Study

This is a description of a single cache hunt that was conducted on Sunday April 18. 2004. In addition to describing the challenges in the caching process, this example tries to explain the community's response to the searcher's efforts. The description is written in singular form as only one member of our project group participated in the hunt.

The process of searching the cache is depicted in Figure 1.1.

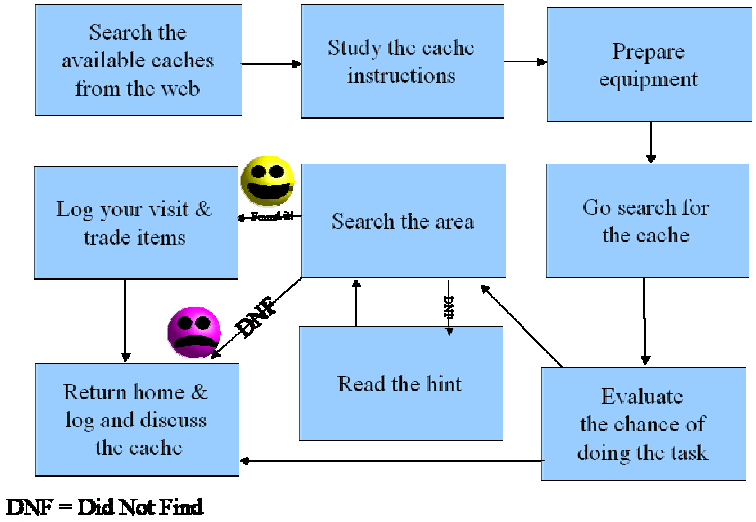

Figure 1.1 Process of Geocaching

Preparation

The preparation is an extremely important part of the caching process. As a new geocacher I didn't even have a GPS device, which basically meant that you had to find the caches using a map. As the target location for this particular hunt I decided to take something more extreme for change. Before this, I had only searched for easy caches but after realizing that the community clearly respected extreme cachers, I decided to give this a go. The target cache was called "Alone in the Dark" and it was placed by a recognized Finnish extreme-cacher alias Stargher.

Knowing this was not going to be an easy task, I read all the previous logs in the Internet about this cache. The logs described the cache environment even more specific than the cache description, so I that there would be a dark pipe waiting for me.

The Hunt

Knowing that the cache would be hard to access, I packed my rubber boots, overalls, a flashlight and a pair of neoprene socks, just in case. When I reached the cache site, it became apparent that I was going to enter a large rainwater drain near the centre of Leppävaara. The water level in the pipe was quite high because of all the melt-water, so my rubber boots were insufficient and I had to go with the neoprene socks and with my pant legs tucked up.

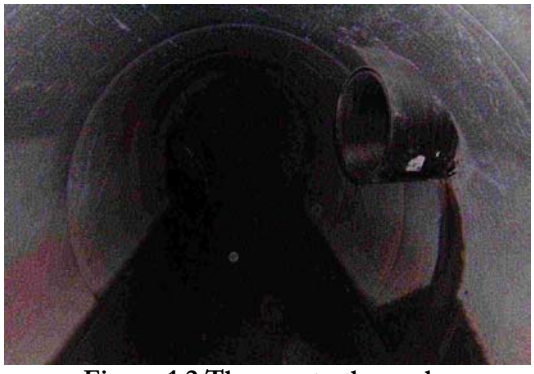

Figure 1.2 The way to the cache

I dropped into the canal and started to wade against the freezing current in a dark tunnel. The feeling was so surreal that I realized that this was an integral part of the community. Sharing an experience of wading through a sewer is definitely a unifying experience for any community. To get a feeling of the environment around the cache, see Figure 1.2.

The finding of the cache was not the problem in this case. It was reaching the cache that was hard. The actual cache was hidden as shown in Figure 1.3, in the first possible place the drain had to offer.

Figure 1.3 The hidden cache

Signing the log is an integral part of the sharing the emotions of the cachers. When I had reached the cache my legs were frozen, so I quickly signed the log and started my way back to the surface. The drain was slippery and I almost fell swimming into the water. When getting out my overalls were rather wet, but at least I was one experience richer and could tell the other cachers what I just had done.

The Aftermath

The most integral part of finding the cache is being able to report one's feelings in the Internet. The community recognizes its members by their logs and actions that they describe in them. Being able to accomplish such a task was clearly a task of winning your own fears but the fact that you had found "Alone in the Dark" and that it could be read on your "resume" was a huge enabler even for a task this stupid.

1.1.3 Experiences of the Geocaching Community

The Geocaching community in Finland is currently around a size of 400 cachers. Generally, the participants are well educated and participate in Geocaching mainly because of the nice addition it gives to normal outdoor activities. Naturally all the members of the community have a bit different needs for their caching experience, but the community seems to respond well to this, as each cacher is able to add his or her own cache into the game.

There are, however, some guidelines that the cachers often respect in geocaching. Here is a list of respected cache properties that has come up in the conversations among the web community:

1. Some like caches that are easy to find, others like the extremely difficult ones that can even hardly be visited.
2. Some respect caches that have lots of visitors.
3. Some respect caches that need the cacher to visit several places, do mathematical calculations or climb to get to the location.
4. Most respect caches, which are available both in winter and in summer and both day and night.
5. Some respect caches that have valuable trade items in them, others like more caches that have stuff for children (toys etc.).
6. Some like caches that can be reached by car or with public transportation; others like to have their caches in the nature far away from the traffic of the city. Some also like the challenge of an urban cache, as it might be hard to avoid being seen while looting the cache. Others like to search their caches in solitude.
7. Most cachers appreciate unique cache ideas and personalized cache material (e.g. Log book).
8. Some respect the nice view or the scenery of the cache area. Some the history and culture related to the area.
9. Some respect having a lot of information about the cache on the web, others want to have merely the coordinates to add challenge.
10. Some competitive cachers like to have many caches in a single area to make caching more effective.
11. Some competitive cachers like to be the First-to-Find (FTF) a cache. They also often respect some valuable item as a first finder prize.
12. Some respect small caches or caches in very surprising places.
13. Some respect the need of logical thinking when searching the cache. Others like caches that avoid being too logically hidden.

The listed features are a strong evidence of the internal control that the community has for the quality of the sport. The most respected members of the community are the ones that are able to create challenging caches for the other members.

1.1.4 Conclusions from Geocaching

The Geocaching community offers an interesting viewpoint for our own game innovation. There are several similarities between the products so some of the working features of Geocaching might be applicable also to our own game, whereas others might not be.

In Geocaching people are willing to travel long distances for a very small reward, just for the fun of it. The key word here is *fun*. It seems clear that being able to find a physical object is a feeling that most of the cachers seek for. If we limit the search into virtual objects, the challenge of finding might not be as interesting for the users.

Geocaching is free which could most likely not be the case with our product. The barrier of starting to play the game is much lower when there is no need to pay for the play. The key issue is to make the customers think they are paying for something useful. For example, it is common for people to accept the cost of gambling so the competition and challenge should be emphasized in the marketing of our commercial product.

As seen from the previous chapter the major driving force of the Geocaching community has been the quality of the free content, content that is produced by the community itself. From the developers point of view outsourcing the content development to the customers is always an appealing option. Meticulous planning and control is required to keep the quality of the content on a desired level. There is always a trade-off in the openness of the product, where too restrictive rules for user content makes the product quickly boring, whereas too open system has a chance of degenerating into a uncontrollable chaos.

1.2 Location Based Mobile Games: Case Mogi

1.2.1 Overview

In order to better comprehend how a location-based mobile game functions we picked a game which seems to be attracting increasingly more attention. The game is Mogi, a "treasure-hunt" game available at the moment only in Tokyo. Mogi is multi-player game played with a mobile phone. Mogi uses the location data provided by the mobile phone to allow the player to interact with his/her surroundings.

Mogi was developed by a small French game company called Newt Games. The developers at the venture capital financed Newt Games had a grand vision of what the ultimate location-based mobile multiplayer game would be. They called this game Kigen and started developing it several years ago. Kigen was to have a completely immersive playing concept with elements borrowed from traditional action and strategy games available on the PC.

Newt Games stopped developing Kigen in 2002 and decided to make a scaled-down version of it. This smaller, lighter version of Kigen is called Mogi. Apparently the reasons behind stopping development of Kigen and concentrating on Mogi had to do with financial issues and the pressure of getting a product out to market. Newt Games signed a deal with the Japanese telecom operator KDDI soon afterwards. Mogi has been available in Tokyo for KDDI customers for beta testing since April 2003.

It seems that Mogi is the only game of its type that has been adopted successfully on a large scale. Other games with similar ideas include Botfighters and Undercover (http://www.botfighters.com/demo/index.jsp, http://www.playundercover.com/index.jsp). The one point where Mogi stands out from these other games is that the main element of most of these games is battle and conquest whereas Mogi is more about collecting and trading.

[Hall, 2004], [Kim, 2004], [Wired, 2004]

1.2.2 Game Idea

The basic idea of Mogi is that it's a virtual treasure hunt in an urban environment. The players can pick up treasures by physically walking towards the place where the treasures are. The treasures do not exist in reality, but instead the treasures are in a virtual world which is identical to and mapped right in top of the real world. The game engine has a complete virtual model of the city (in this case Tokyo) and when the players move around Tokyo in reality they also move in the virtual Tokyo.

Mogi has two types of players: mobile players who move around the city collecting treasures and web players. Web players can see the entire map of the game and can thus help mobile players in finding the treasures. The basic UI of the mobile player consists of a radar screen which gives information on the player's surroundings. The interaction between the web and the mobile players as well as the game UI will be discussed in more detail below.

Central ideas of Mogi include forming teams to hunt for treasures together and trading these objects or treasures with other players. One of the aims of Mogi is to get a collection of treasures. For example a player might have five different "flowers" that each has its own value in points. If the player gets the sixth flower that completes the flower collection then this raises the points of the whole collection above that of the sum of the individual flowers. This makes it worthwhile for players to make a large detour from their normal daily routes in order to get that last missing object from the collection. It also means that trading with other players is important for succeeding in the game.

Mogi also allows players to get information on the location of other players. The radar screen of a player has a certain range that displays all treasures and other players within that range. However the game interface notifies the player of other players who are outside the range of the radar. This gives the player a feeling that he/she is not playing the game alone even if there are no other players close by. The players might also meet in real life by locating each other using the information from the radar screen, but it isn't clear what purpose this would serve or even if players would want to meet in reality.

Mogi puts the player in control of the game. The radar screen is not updated all the time, but only when the players wants to check their position. This reduces data traffic between the mobile phone and the operator's network (reducing costs to the player) and also allows the player to be in control of exactly how they play the game.

Mogi is a service offered by the operator KDDI to its customers. There are two kinds of costs to the player: a monthly fee of 315 Yen (~ 2,5 €) for the basic service i.e. activating the game for the player. On

top of that comes the data transfer costs. Each time the player gives a command from their mobile phone some data is transferred and the operator charges for this.

1.2.3 Technology

Mogi uses mainly normal and widely-available technology, but they also offer some technologies that are unique and essential to playing Mogi. The positioning technology in Mogi is a clever mix of mobile phone radio signal positioning and GPS-positioning. The radio signal based locating is used when the player is just wandering around the city and doesn't need such accurate information on the exact location of treasures. GPS-positioning is used when the player approaches the treasures or other players and needs precise information in order to get close enough. Mogi could be done with only radio signal based positioning, but the accuracy of the radar screen would suffer. This is quite a central concept of Mogi: the player actually has to get close to the location of the treasure. Currently an accuracy of 400 meters is required, i.e. the player needs to be within 400 meters of the treasure in order to be able to pick it up.

The fact that Mogi was launched in Tokyo could be due to technological, cultural and business reasons. Tokyo is one of the largest cities in the world, so in order cover the high initial cost of modelling a single city it makes sense to use a very densely populated city. This way the potential user base is larger. The general view is that the Japanese culture is oriented towards using and accepting new technologies quite quickly. Also the GPS phones and operators were at the start of Mogi's beta testing in 2003 only available in Japan.

An interesting side-note is that Mogi uses an open source program called Hoko for some of its middleware functionality. According to the Hoko website Hoko is a program that "provides a middleware for location based services".

[Hoko, 2004]

1.2.4 Testing the Game

The Mogi game can be tried out via the Mogi web site (Mogi, 2004) using a dummy password and user name of test, test. This allows one to access the web interface of the game, but not the mobile interface.

The website is built completely with Flash and Shockwave. The overall appearance of the website is very colourful and cartoon-like. The web page briefly explains what the game is about and presents a login screen. Once logged in the player is presented with the web interface of the game.

Web players can see the mobile players on a map of Tokyo which can be viewed both in 2D and 3D. The web interface can be used to scroll through the entire map of Tokyo. All the items and players are visible on the map. The idea of providing this kind of interface is that web players can see when a mobile player is near an object and the web player can send the mobile player directions to guide them to the object or treasure. The web player and the mobile player in this case do not need to know each other in advance. This sort of interaction does not sound very special, but it is in fact very addictive. Even when the game, the players and the city are completely new and unknown as in the case of Mogi it can be very tempting to help the mobile players achieve their goals.

The game has an internal mail and instant messaging system for players to communicate. Information on online players could be displayed so that one could check out how other players have done in the game. The web interface seemed to have a lot of other functionalities as well and it would have been interesting to find out more about these.

Figure 1.4: Mogi website and login screen

Figure 1.5: Mogi web user interface

Figure 1.6: Mogi web user interface with 3D map

1.2.5 Conclusions

There are many lessons to be learned from Mogi as it shares many ideas with the game Dealer. The interaction with other players seems to be a key factor in the success of Mogi. Also the nature of Mogi is quite different from many other mobile multiplayer games. Games where fighting and conquering are the main goals do satisfy a certain audience, but co-operative playing can be more appealing to a much larger audience.

The co-operation between the web players and the mobile players seems to work well. Helping (or hindering) players one has never met doesn't at first sound very exciting, but it seems to be a good motivator for players to get to know each other. This is a very strong element for community forming.

Players of Mogi have reported that they can make detours while moving around the city just to pick up the treasures in Mogi. This was one of the ideas that Dealer is based on as well: that players would play the game when moving around the city while returning from work, doing shopping, etc. The fact that players are willing to deviate from their normal routes just to play the game is an important point.

Dealer and Mogi have many ideas in similar. It is good to note that many of the similarities are coincidental since the basic ideas behind Dealer were thought up before any deeper research was done into Mogi.

1.3 Online Multiplayer Strategy Games

1.3.1 Overview

Online multiplayer strategy games in this report refer to games which are played mainly through the web browser and have a duration of several weeks or months. The majority of these games are turn-based with turns that last usually one hour. Having a lot of strong friends is a necessity in these games and players playing alone or in a weak community rarely have a real change of success.

All of these games are played with the intention of growing and developing the community the player belongs to, but also individual performance is rewarded. The intention is to grow yourself and conquer of defeat the other communities. Few of these games feature also different tasks or missions which result in better items or money as a reward, but this is quite rare.

Examples of these games are

- Dawn of Myth (http://www.dawnofmyth.net/)
- Castle Quest 2 (http://cq2.mct.nu/indexnl.php)
- Planetarion (http://www.planetarion.com/)
- Star Sphere (http://www.starsphere.net/)
- Dominion (http://www.kamikazegames.com/dominion/)
- Utopia (http://games.swirve.com/utopia/)

All of these games are played through a browser interface and are free, with the exception of Planetarion. (Also Planetarion was originally free when it started at January 2001, but turned commercial during 2001-2002. Now it's also possible to play Planetarion for free, but the game experience is then strictly limited to lower levels and playing for free acts as a "try-out" mechanism.) Because of the non-existent revenue from players, these games are usually run by volunteers and are developed by a few people as a kind of a hobby. Server space is acquired by sponsorship deals and/or with advertisements on the site. Also because of the amateur development, the game graphics and supplementary materials like user manuals are usually less attractive or inclusive than fully commercial online games.

However, despite the lack of polish or graphical splendor and because of the free nature of these games, they enjoy a large user population of thousands of players per game. For example, at it's prime, Planetarion had 100.000 players, which later dropped all the way down to 6.000 after commercialization [ImAFish, 2002]. After that the game developers have been trying to improve the game to increase the number of subscribers, but so far they have been unsuccessful in doing that. One reason for this is that there are plenty of other free alternatives, some even better, where the players can turn to.

[DoM, 2004], [CC2, 2004], [Planetarion, 2004], [SS, 2004], [Dominion, 2004], [Utopia, 2004]

Figure 1.7 An example screen from Dawn of Myth

1.3.2 Motivation

Players have naturally many reasons for playing these games, but number one reason seems to be visibility on the Top-10 charts [Salminen, 2004]. Usually games feature multiple different high score charts based on points or other achievements in the game (such as most planets or the shortest lifespan). After the game, players tend to brag about a good position on these charts and many actually keep a history of their score in the signature tags in game forum posts.

According to Salminen, other reasons to play these games are the community spirit and friends and the low paced nature and the long life span these games have. A game can last as long as six months and during this time it's easy to make friends amongst the ones you play with.

1.3.3 Community Role

In online multiplayer strategy games communities have a very important role in the internal game dynamics. Players form, or are formed into, different communities, which then compete against each other. Inside the community players are able and are encouraged to work together, share resources and generally play as a joint entity. Without the help of the community, players will be an easy prey for an organized group of other players that work together. In addition to defense, also hostile actions are performed more successfully together by the group.

The communal aspect reaches also further than to the players in the same surrounding group. To be really successful in the game it is vital to make connections to other groups and form alliances with them. In practice this is mostly done by actively using IRC and it is very helpful if one member of the group wants to hang out at the IRC channels. Many alliances formed inside one game tend to continue inside other games, some of which are totally different from the original concept. [Salminen, 2004]

1.3.4 Economics in Online Multiplayer Strategy Games

All of these kinds of strategic games concentrate on gathering resources in some shape or form. Players are usually able to gather multiple types of resources (e.g. energy and raw materials), which they later on can use to produce or purchase more game elements. In addition to resources, players can also usually own

sources of resources, which produce these elements with a certain speed. With a difference to actual resources, these sources can usually be stolen or conquered by other players.

Usually it is also possible to donate these resources to other players in the same community or alliance with an intention to help that player to be a more effective asset to the community. However, surprisingly it is not that common for a game to have an actual trading function, where players would exchange raw materials for other materials or money.

Dawn of Myth features this kind of functionality with two possibilities for exchange:

- *trading with the system itself* – here players can exchange some asset for another with the game engine for which they have to pay a tax (percentage from the trade).
- *trading with other players* – here players can announce that they want to sell *x* amount of some element and other players can respond that they would like to trade it to same *x* amount of something different. In this game, different elements are equal and there are no price differences between them.

[DoM, 2004], [Planetarion, 2004], [SS, 2004], [Dominion, 2004], [Utopia, 2004], [Salminen, 2004]

1.3.5 Differences in Virtual Economics and Real World Economics

While the economics inside the games remind us of the real world economics they are inherently different than in the real life as Castronova [Castronova, 2003] points out. A couple of examples of this are explained underneath.

Control of Prices

With real life economics, it is not wise, or even possible, for a government to control prices in a market economy. In a virtual economy however, the "government" or the game administration is able to control the prices easily. All of the goods in the game are digital and therefore they can be costlessly created or destroyed. Because of this lower prices are not caused by excess supply and vice versa higher prices are not caused by excess demand. Some games are trying to create authentic economic models, but in some cases it's better to control the prices to better the virtual experience.

Discontent

In the real world economies, work sometimes causes discontent because of low wages, poor working conditions or just because of the free time that is lost. Generalizing, in these cases work is the source of the discontent. In virtual worlds however, lack of work causes discontent. The less players have to do, more discontent they are. The amount of profit from a task performed of course has an effect, but if the game structure prevents the players from being engaged in a meaningful activity, they get bored.

Economic Growth

In real life, economic growth is always good. In a virtual world increasing wealth can make it too easy to accomplish different tasks and missions, which lowers the challenge of the game and makes the game less interesting. So in a virtual economy, economic growth can also be bad, although it's almost always striven for.

1.3.6 Communication and interaction

Players use a wide variety of communicative means in online multiplayer strategy games from instant messaging to private forums. The method of communication depends largely on the target audience.

Most games feature an in-game email for players inside the same community for targeted communication. For a bit wider audience, web forums are a better option. Forums are used for many different purposes and usually games feature integrated forums for communication inside the player's own community. Sometimes games might feature also an in-game forum for communication inside alliances. Forums are also used for communication outside the game, both for players actually playing the game and for external viewers. These forums work as a meeting point for discussion about the game events and topics surrounding the game. Many times they also provide a stepping-stone into the game world for the inexperienced player.

In addition to the forums, especially IRC is used for the intra-community communication. IRC acts as a place to hang out, talk about community tactics and receive the latest information of the game events. Some people for example might keep the IRC screen open while working or doing other things at home

and periodically check it if anything urgent has happened. An alternative for IRC is instant messaging, which is also used mainly for intra-community communication.

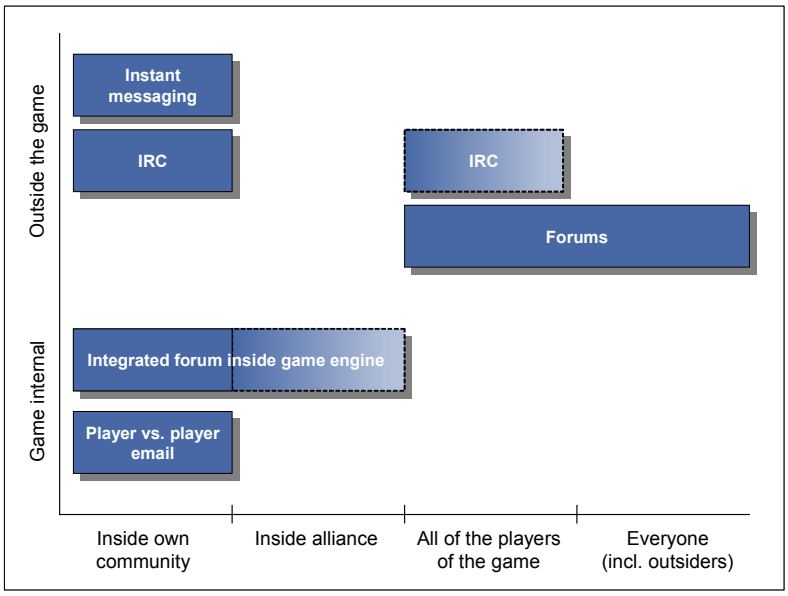

Figure 1.8 Methods of communication

Inside the game world, basically all of the games have very similar interaction forms. In addition to sending messages to other players, it is usually possible to attack or defend somebody, trade items or make donations to somebody or conduct political actions, such as declaring alliances, peace or war. All of this kind of action is performed solely inside the game world, although especially the political actions might be preceded by discussions in the real world.

[DoM, 2004], [Planetarion, 2004], [SS, 2004], [Dominion, 2004], [Utopia, 2004], [Salminen, 2004]

1.3.7 Power Structures

Online multiplayer strategy games usually have a very loose power or command structure. Some games use concepts of "commanders" or "generals" who have virtual authority over other players in the same group. These power figures also enjoy some kind of privileges that come with the status. These privileges might include extra resources or additional capabilities that other players do not have. However, these additional privileges are rarely that meaningful.

The more important power structure resides outside of the game itself and depends a lot on the activeness of the player. Very often it is the inner circle of the active players who decide what the group does, where to attack and who to make an alliance with. At first sight this might seem to be a very totalitarian structure but in reality players themselves can choose how active, and thus how inside, they wish to be. A successful group needs these kinds of active players in order to be able to coordinate activities inside the group. If how the way things are run doesn't please the players, in most games they can always "vote with their feet" and change the community they are a part of. It happens that a group of players form their own community because of the differences in opinion with the rest of the group.

[DoM, 2004], [Planetarion, 2004], [SS, 2004], [Dominion, 2004], [Utopia, 2004], [Salminen, 2004]

1.3.8 Problems

The biggest problem in online multiplayer strategy games and in online games in general is *cheating*. There are many different ways of cheating, but most of the common ones in strategic browser based games are *multi'ing* or *farming*. In multi'ing the same player uses several different accounts in the game to boost his performance or to hinder others. For example if one manages to create an account in a competing alliance, they can spy on their activities or cause direct harm in a critical moment. Farming means that one player

has such friends in the game, whose sole purpose is to produce materials or other elements for that player. Even if these people aren't really playing the game, they keep their account alive for farming purposes.

Both of these methods of cheating are greatly frowned upon in the gaming community and game developers have tried to develop means to get rid of these kinds of loopholes. For example in some games you have to log in once a week, otherwise the game account gets closed. Other means include banning several accounts under one IP address. Despite the possibilities, cheating has not become a serious problem for these games, because they enjoy an active player community, who monitor activities of other players quite effectively. For example, if somebody notices multiple accounts on one player, it is immediately told to the game administration, who usually remove those accounts from the game quite fast. This kind of "civic vigilance" plays an important role for these games to stay fair and equal for all.

[DoM, 2004], [Planetarion, 2004], [SS, 2004], [Dominion, 2004], [Utopia, 2004], [Salminen, 2004]

1.3.9 Business Models with Online Multiplayer Strategy Games

Two different business models can be identified amongst browser based online multiplayer strategy games: *free games* and *commercial games*. Even though the amount of *pay-2-play* games is very small at the moment, one could assume that commercial browser based gaming might grow in the future. So far, nothing has really separated the free games from the commercial ones and so players have been easily able to switch between the games. With a decent concept and appropriate graphical user interface it would be possible for a non-free game to be successful.

Commercial games have one or two income sources, namely the subscription fees from the game itself and the possible advertising revenue. In Planetarion, the fee for one game is currently 7€, or if several accounts are paid at once the fee drops below 5€. If one round lasts for 3 months with approximately 6.000 players, Planetarion would make approximately 120.000 € per year[2] from the subscription fees.

Free games on the other hand do not use entry fees. Revenue is usually generated mainly from donations and advertisements. In addition to passive means, players are also actively encouraged to click on the sponsors' links to increase the click through rates. Some games also feature *Premium accounts*, which cost a little to the players. With these accounts the advertisements are usually removed and players are provided with extra functionality, such as in game calculators (e.g. battle calculator for battle outcome estimation). It is hard to estimate how much revenue the free games generate with these techniques as the administrators seldom publish such information.

[DoM, 2004], [Planetarion, 2004], [SS, 2004], [Dominion, 2004], [Utopia, 2004]

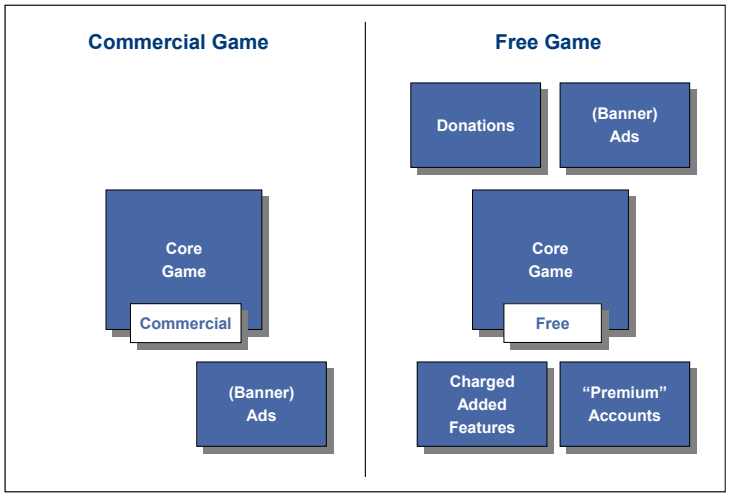

Figure 1.9 Browser-based game business models

[2] 6.000 players, 4 3-month games with 5€ as the average subscription fee

1.3.10 Conclusions

The biggest reasons for players to play these kinds of games seem to be the feeling of togetherness and interaction in a community and the prospect of getting their name on the Top-10 list. The vanity factor seems to drive people to play all sorts of different games, as the popularity of text message based TV games and chats prove and it also motivates people to actually pay for that experience.

The price can have also a devastating effect on a game, which was seen in Planetarion's case. When players do not feel that they are getting their money's worth they will quickly turn into other less expensive alternatives, if there are any. Unsurprisingly, the key seems to be in providing an experience that the players can't get anywhere else for a smaller price.

1.4 Mobile Game Business Models

To understand the future developments around the mobile gaming industry, it is critical to be aware of the currently used business models. This categorization of business models is adopted from the Nokia Corporation's material for game developers [Nokia, 2003].

1.4.1 SMS Games

Before mobile phones had the luxury of large color screens and fast data connections the games had to be simplistic, yet addictive to be profitable. In this model the SMS messages are sent to a special short message number that is offered as a service from an operator. The developer of the game is able to collect around 20 to 50 percent of the revenues from the fees paid by the players.

1.4.2 Browser Games

The concept of browser games refers to games that take advantage of web technology to enable gaming features. These technologies can vary from WAP/WML-based pages to XHTML and i-Mode games. The developer revenue in this model is a bit problematic, as the games might be hard to find for the user. In Japan NTT DoCoMo has revolutionized the whole industry by selling games, developed by a third party, through their highly popular mobile portal. NTT DoCoMo takes a share of around 8 percent of the game sales in addition to the data transfer expenses the users are paying.

Until recently the browser games have been quite simple, but that is bound to change as e.g. Macromedia Flash player is already introduced into mobile devices. Flash games could turn out to be a good business if the installed base of the players begins to rise. From developers point of view Flash games are fairly uncomplicated to create, which could considerably shorten the average game development process.

1.4.3 Java Games

Sun Microsystems' Java 2 Micro Edition (J2ME) technology has become the de facto standard in the interpreted mobile gaming field. Currently the business model has largely been based on the Over-the-Air (OTA) delivery method, where the user initializes the download by via, for example, SMS and then downloads the game using a mobile data connection. The value distribution of the OTA delivery is further described in the next chapter.

In addition to Java games, there is a collection of other technologies, such as BREW, that enable interpreted games to be played on a mobile device. However, in ARC Mobile Handsets Industry Survey estimate from 2003, their role will be marginal still in 2006, at least compared with Java technology [Kangas, 2003]. Even though this might be the case from today's point of view, the emerging technologies are out there and the de facto standard position of Java is able to last only as long as it is supported by the manufacturing industry.

1.4.4 Native OS Games

Native source code based games are generally developed using the same environment that the operating system of the mobile device uses. This method enables the games to take full advantage of the processing power of the device. Native games can be delivered Over-the-Air as the Java Games but as there is less limitation to the size of the application, these games are usually downloaded via IR or Bluetooth connection.

Nokia's introduction of N-Gage platform brought forth another form of delivery for native Symbian OS games. So called "rich games" business model works much like the traditional video and console game industry by offering the games in retail stores. This allows the developers to design an effective package with an appealing revenue model.

1.5 Value Chain in Downloadable Games

The method of value distribution in downloadable mobile games is characterized by the strong link to selling other mobile services, such as ring tones.

Starting from the beginning of the chain, first of all the content related Intellectual Property Rights (IPR) must be solved. Usually this means that the developer buys the license to use a certain theme in their game. On the other hand the owner of the rights might be more willing to outsource the development of a game rather than licensing it away. Depending on the case, the IPR owner receives around 10 to 20 % percent of the sales price (Nokia, 2003).

The most crucial player in the value chain is undoubtedly the application developer. The developer has to have a good knowledge or the target platform as well as extensive capability to innovate new products. Even the best innovation needs a business framework around it and this often requires the developers to partner with other actors in the chain. Currently the common trend for the developers is to search for strong aggregators for their games. The access to a large customer base is the essence of a profitable title and the aggregators often have customers ready and waiting to pay for sensible services.

Moreover, from the developers' point of view the service aggregators are just another useless intermediary in the value chain. For example the handset manufacturers and mobile games publishers can act as aggregators and can take a profit of 5 to 89 percent of the sales price [Nokia 2003]. The role of this link in the value chain makes it desirable for the developers to become aggregators themselves, initially for their own products and possibly later on also for third party games.

In a mobile business the network operator is always a key player. The mere role in offering the data transfer infrastructure is usually not sufficient for the operators and in many cases they have diversified into portal or aggregator level. From the operators perspective the selling of the product is the most interesting step in the value chain as the operator already controls a billing mechanism for its customers. This mechanism may be profitable even without diversifying as operators can receive 3 to 10 percent of the game sales price by forwarding the revenue from the customer to the aggregator.

The end-customer contact is the portal that offers the game titles for download. The portal's value is totally dependent on its customer base. Finally, in the end of the value chain there is the customer. Currently the customer is paying on average $3 to $8 for a downloadable game, depending on the product and market. The whole value chain model is depicted in Figure 1.10: OTA Value Chain [Paavilainen, 2004].

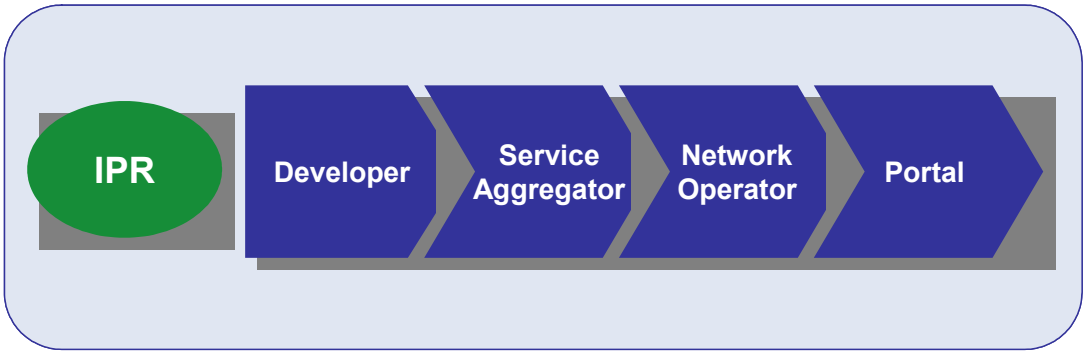

Figure 1.10 OTA value chain

2 DESCRIPTION OF INNOVATION

2.1 Scenario

Jaska wakes up after an uneasy night. As soon as he turns on his mobile phone Jaska receives an urgent message from his Dealer-buddies warning him of their rivals' achievements in the past 12 hours. "Dam!" he mumbles to himself. "Again the Kallio-gang has been selling coke to my homies on my turf." Jaska dashes to his computer to check out the action last night.

Jaska sees from the D.R.U.G (Digital Rapid Urban Game) interface that his friends have been successfully selling large amounts of cocaine in the Helsinki city centre. Jaska is especially satisfied with his friend Pete,

who sold a good batch of ecstasy deep in Kallio. All the places where Jaska's gang did business last night are visible on the map. Also the amount of drugs and profit generated can be easily seen from the game interface. Looks like it's going to be another great day in the drug business for Jaska.

Jaska heads off to his real work at Stockman's Herkku fish department. During the trip on the bus he decides to check the latest prices with the dealers on the way. He flips through the week's price history although it's more a matter of routine than getting new information: Jaska has been involved in the game so deeply that he knows most of the prices by heart. Business has been mostly good, but the cash cow of Jaska's gang, cocaine, has seen some alarming drops in its market price within the past few days. "Could somebody be dumping coke in our territory in order to gain control of our region?" Jaska thinks while hopping of the bus in central Helsinki.

Work is boring as usual. While slicing through salmon Jaska entertains himself by sending messages to his friends about the tactics for tonight's sales. Jaska's gang has been doing very well in the high-score lists for some time now and last week they almost achieved top spot that would have meant a short TV interview for the whole group. Unfortunately that opportunity just slipped by, but Jaska is determined to see himself at the top. "All my friends back home would be so jealous", Jaska smiles to himself.

As evening approaches Jaska leaves his workplace and flips on the Dealer-game in his mobile phone. He is quickly given an update on the status of other players and potential buyers in his immediate surroundings. "Well would you look at that! Someone is asking for cocaine and it's only a few blocks away from here". Jaska sprints towards his potential buyer with a familiar grin…

2.2 Game Overview

Dealer is a mobile, multi-player, location-based trading game with a strong community element. The game takes place in an urban environment. The goods that are traded are drugs. The basic idea of the game is that the players move around the city buying and selling virtual drugs at specific locations. Players can also trade the drugs with other players.

The main objectives of Dealer are to get money and power. Money can be achieved by selling and buying drugs. Power is achieved by controlling certain areas and/or teaming up with other players to form gangs. The third element which players aim to get is reputation. Reputation can be obtained by completing different missions inside the game. These are described in more detail below.

A factor which cannot be measured directly in the game, but which probably has the biggest impact on players is the prestige obtained by a player in the community. The game has several tools to support this effect. The best players get their names promoted on high-score lists and players can view each other's achievements and compare them with their own. High-score lists are arranged in many categories such as "most money" and "most reputation". The high-score lists can also be arranged by region so that a player can be the regional champion even if he/she isn't the best of all the players in the entire game.

The city of Helsinki was chosen as the initial playing arena. The element of regions is used strongly throughout the game. Each region in Helsinki has its own characteristic good and bad points. Each region has tendencies towards a certain drug or multiple drugs. This means that a region can often supply a drug for a lower price than other regions can. Also the demand for drugs varies from region to region. Regions can become "attached" to a certain drug so that users flock to that region in order to follow a particular drug.

Players can also achieve money, power and reputation by completing tasks. The tasks differ from the main idea of the game, i.e. trading. Tasks can range from hit-and-run-like virtual assassinations to acting as a courier for a special package. Tasks can give players money, hints on good locations of lucrative drug distribution spots or crucial information about other players who can assist the player.

A player can buy and sell drugs to and from other players. In addition to this there are computer-generated "sales-agents" who only sell drugs; they do not buy anything. Also the end-users of the drugs are computer-generated. The prices of the drugs sold by the computer-generated agents cannot be known in advance, so that a player has to physically move to where the computer-generated agent is in order to find out the day's price. By having both human and computer players in the game a human player can choose different courses of action: buying only from computer-generated agents and selling only to the computer-generated end-users or trading only with other human players. Success in the game comes from a balanced mix of these tactics.

A central concept of Dealer is teamwork. A player can play the game alone and be successful, but teamwork allows for much more complex interactions. Players can form gangs in order to try and control

the regions in the game. Players can also trade the drugs with each other within their team so that they can benefit from team members living in different places.

Some concepts of Dealer that might be introduced later on include roles, equipment and a Mogi-style web interface. Roles would allow players to specialize into different characters such as courier, money launderer, pimp, spy and on top of them all "the Don". Equipment would mean that players could buy either with real or virtual money equipment to help them better succeed in the game. This kind of equipment could include weaponry to eliminate rivals, better carrying cases for drugs or simply clothing for the player's avatar to increase jealousness among other players.

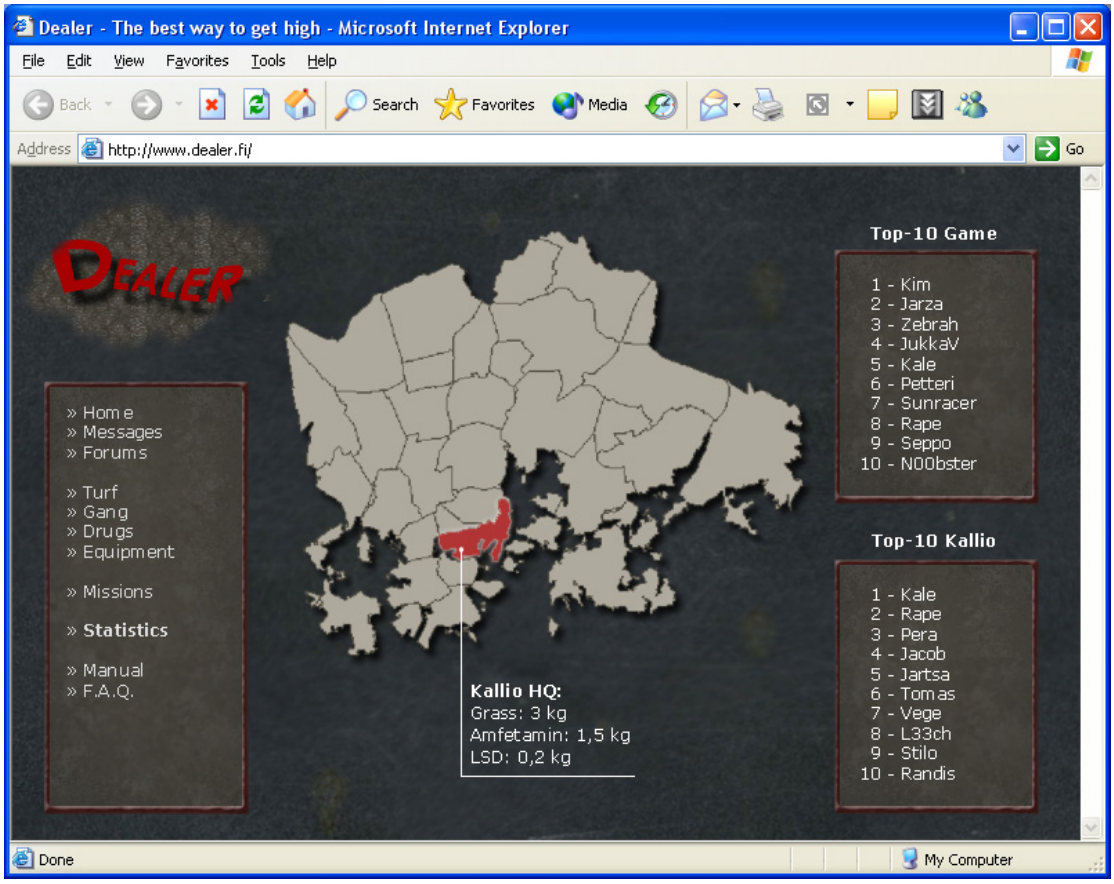

Figure 2.1: Example of the Dealer high-score list including local and the total top lists

The main principle behind the world of Dealer is to allow players a large degree of freedom. The game should only set the main boundaries and interfere as little as possible in the actual playing of the game. The game engine must be fair and equal to all players. The community would set its own rules within the game that would have much more effect on playing the game than the rules of the game engine itself. The game would also have built-in means of penalizing players who abuse the rules. The offending player(s) could for example be thrown into a virtual prison and thus denied from playing the game as usual. This of course brings up ideas for in-prison drug traffic, but these kinds of concepts were not explored yet.

Another central idea of Dealer is that players can enter and leave the game quite freely. Players can choose when they are playing the game, meaning that they can turn on and off the gaming mode at free will. This means that players' locations won't be continuously tracked, but only when they are playing the game and even then only when the players want to let the game engine know their position.

The technology required by Dealer is available in Finland and in theory the game could be started at any time. More advanced handsets and 3G-networks would make the game experience much more enjoyable. The positioning data could come only from the current GSM network without any GPS data and the game would still be quite playable.

As the examples of geocaching and Mogi have shown players are willing to spend time and energy in moving around the physical world in order to play a game. To ensure that Dealer doesn't reach just a minority group of enthusiasts the technology-side of Dealer needs to be as transparent as possible to the players.

2.3 Community Challenge

Probably the most important point in implementing Dealer successfully is ensuring that there is a well-functioning community inside the game. The game rules have be set so that they keep the game's atmosphere friendly, yet competitive. Dealer could be played by single players and small teams, but this way the game wouldn't reach its full potential.

The game needs to allow players to co-operate quite freely and encourage communication between players. The web-mobile-connection has not been explored in this document, but it has a lot of potential to introduce the game to a large audience and allow people to take part in the fun even though they are not actually playing the game themselves. The web interface could be seen as a kind of marketing channel for Dealer.

One of the things that communities in games are often used for is feedback. If the community is allowed to suggest improvements on existing ideas and even totally new ideas then the player's feel that they can affect the game which will tie them to the game even closer. However, it is still important to keep the details of the game hidden so that the game can always surprise the players.

Another issue that hasn't been addressed in this document is the possibility of real-life meetings between players. It isn't clear how the game should work here: should these kinds of meetings be encouraged, avoided or should the game be indifferent in this matter? In Mogi the players were informed of the locations of other players and Dealer would have similar functionalities as trading with other players is an integral part of the game. But the interaction between players brings along discussions about safety and responsibility and these need to be addressed before Dealer could be played on a large scale.

3 BUSINESS ROAD TEST

3.1 Business Model

There are several roles that the firm could take with regard to its position in the market. A pure developer role would mean that the firm would not be in direct contact with the end-users, but that a large partner such as a game publisher / telecom operator / handset manufacturer would take care of things such as marketing. This has its advantages, but this way the developer is at the mercy of the larger partner and the vision of Dealer probably would not be fully realized. The more appealing position is that of a firm which develops the game, but also handles the contact with the end-user. At least one large partner is still required, but now the roles would be somewhat different.

The main revenue sources for the firm would be registration fees from end-users, revenue-share from the telecom operator and advertisers. The motivation for the telecom operator is that Dealer would bring data traffic to their network that the operator could then charge from the end-users. Also the operator could charge for the initial downloading of the game although it is more likely that the end-user is presented with a nice package that would include the game, a few months of registration and a certain amount of data traffic. The revenue from this package would then be split between the developer of Dealer and the operator.

The role of the advertisers is not explored here in more detail, but it seems that there are possibilities to develop good deals for both sides. The nature of Dealer will definitely repel many companies, as they do not want to attach their image to that of a drug-dealing game. Still the fact that Dealer includes mobile phones, the internet and television as its media will increase its appeal in marketing terms. Also the end-users belong to an attractive group of young urban adults. However, the most interesting opportunities for advertising deals come from using the location-based nature of the game. This allows very specific promotion of individual stores or all the stores of a single chain within a city. Companies could buy the locations of the computer-generated agents so that players could be lured towards certain areas. Below is a representation of the relationships between the different actors.

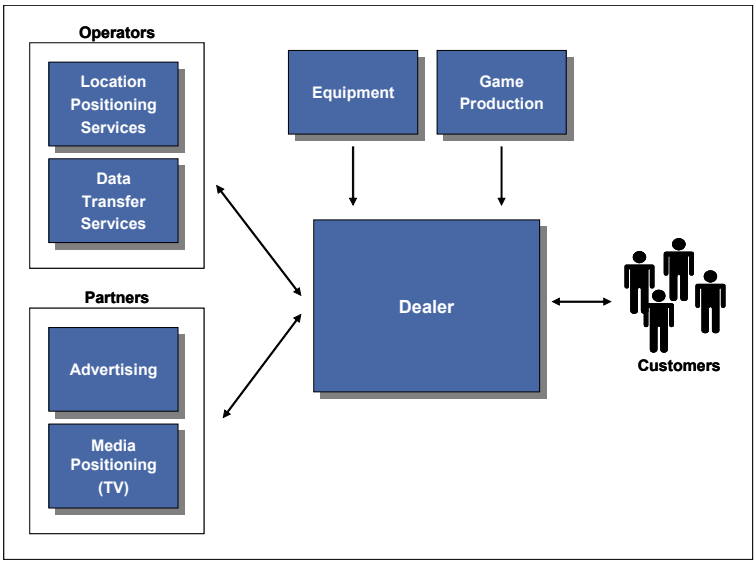

Figure 3.1 Dealer business model parties

3.2 Market Macro Analysis

The business idea presented in the previous chapter falls quite clearly under the mobile gaming market, purely by its mobile nature. The game also has some strategic and cross-media features, which place it to a broader online and cross-media gaming market, with competition from the likes of Planetarion and MTV3's mobile TV games. While the placement of this business idea is broader than only mobile games, the following study concentrates on the mobile gaming market, because the mobile element is an essential and dominating part of the concept.

3.2.1 Market Size

During the last few years the telecommunications industry players have begun to see the huge business potential behind mobile games. As the whole industry for digital games is quite young, the playing is often seen as an activity for teenage boys. Today, this is not the case, as the average age of a player of computer games is 28 years [IDSA, 2002] and playing in general is becoming accepted everyday activity. With mobile games, the average age of a player still is quite young, 16-24 years [Miettinen, 2004], but the same trend that has happened with computer games is likely to happen with mobile games as well.

Despite the effects of recession, the video game industry has been growing during the recent years. The handheld and mobile games market represented 7,3% (6,2% and 1,1% respectively) of the global games market during 2002. However, that share is growing. In the E3 convention held during summer 2003 14% of the games shown were directed to handheld or mobile devices. [Poropudas, 2003]

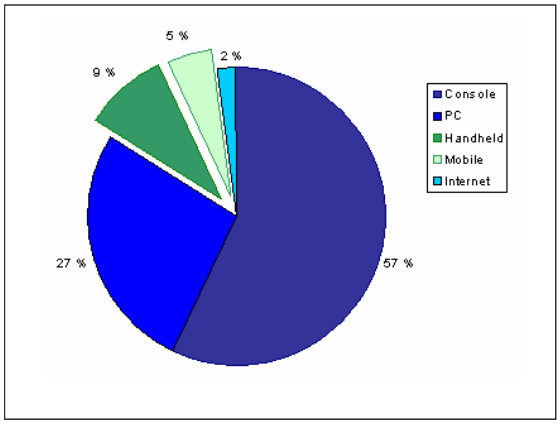

Figure 3.2 Shares of game types introduced at E3 in 2003

It is estimated that there were 119 million mobile gaming users globally and 21 million users in Europe during 2003 [Miettinen, 2004]. Furthermore, according to the telecom operator O2, currently 16% of mobile phone users regularly play games with their phones [Miettinen, 2004]. If this figure is applied into the Finnish mobile gaming market, it would mean that there would be 560.000 mobile gamers in Finland[3].

There are several different views about the size of the actual mobile gaming market. The global mobile games market was already in 2001 suggested to be around a size of $400 million by [Nokia, 2003]. According to Analysys and telecom operators the mobile gaming market is estimated to be between 200-800 M€ during 2002 and 2003 [Miettinen, 2004][Analysys, 2003(1)][3G, 2003][Poropudas, 2002].

3.2.2 Market Growth

Also the estimation of future growth varies greatly and estimations for Europe for 3-4 years into the future range from 3 billion € up to 7 billion €. According to GameSpot [GameSpot, 2003] the yearly growth rate of the market after 2001 has been around 100 percent and the estimates for the future sales go to figures of around $7 billion in 2006, for Europe alone. The following forecast has been calculated as an average trend between all of these different estimations, which are also presented below.

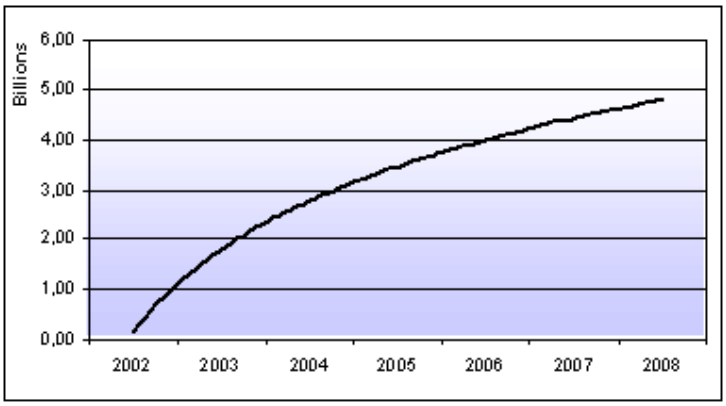

Figure 3.3 Forecast of mobile games market growth during 2002-2008

Mobile Gaming market (million €)							
Europe	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Frost & Sullivan		800			7 000		
Analysys	200						3 000
3g	800				7 000		
W. Eur. operators	255			3 000			
Average	**418**	**800**		**3 000**	**7 000**		**3 000**

Figure 3.4 Different estimates for mobile games sales
[Miettinen, 2004][Analysys, 2003(1)][3G, 2003][Poropudas, 2002]

In any case the growth of the market during the next few years is substantial. The reason behind such high expectations for the market growth lies behind the historical statistics and current developments in mobile devices. The boom of the Internet based multiplayer gaming suggests that the same phenomenon could easily be achieved also in the mobile business, especially now that mobile Internet connections are becoming more popular and as the Internet connectivity is already embedded in the device. Also, as of today, 80 to 90 percent of the mobile game market has been in Japan and South Korea [Kangas, 2003]. This suggests that the same market penetration could be possible in both Europe and the United States.

[3] According to Ministery of Transport and Communications Finland, there were 3,5 million mobile phone users in Finland at the end of 2002 and this number is not predicted to grow substantially in the future [MINTC, 2004]

Forrester Research predicts that in the year 2007 45% [Miettinen, 2004] of the mobile users would play games on their mobile device. This would mean that the gamer population in Finland would increase from the 560.000 players to 1,6 million players.

3.2.3 Favorable Market Trends

Economical Trends

The economical growth is getting stronger in Finland along with the rising global economy according to Bank of Finland [BOF, 2004]. The growth is also estimated to be steady during 2004-2006. The GDP is estimated to grow with 2,6% in the upcoming years which is 0,7 percentage units more than during 2003. Also real earnings are estimated to grow by 2,3%, 2,0% and 1,6% respectively during 2004-2006 and private consumption roughly by 2,6% during this time.

Socio-cultural Trends

Until quite recently, the general public hasn't been very aware about the mobile gaming concept. As mobile technology companies such as Nokia are bringing gaming related devices to the market it increases the knowledge about the possibilities in mobile gaming.

Technological Trends

The introduction of Java-based phones has made it possible to produce games with relatively small modifications for a wide spectrum of devices. It is estimated that 60% of the terminals in the market in 2005 will be Java-enabled devices [Miettinen, 2004]. At the same time most of the new phones will feature a GPRS or an EDGE connection, which makes it possible to be connected to the Internet on a continuous base.

According to a view by Gartner, which they represented during Gartner Symposium ITXPO in Cannes at the end of 2003, wireless broadband and GPRS are already out of the "hype" and starting to mature into productive use followed closely by EDGE and WCDMA technologies **[Gartner, 2003]**. In other words these technical features are starting to be mainstream technology, which is available to the majority of consumers.

Gartner presented the following illustration about the maturity of mobile related services and concepts during Gartner Symposium ITXPO in Cannes at the end of 2003. One can see that wireless broadband and GPRS are already out of the "hype" and starting to mature into productive use followed closely by EDGE and WCDMA technologies.

These aforementioned features are making it possible for a large number of people to play multiplayer online games with mobile terminals. Terminals are also getting graphically more attractive with bigger color screens, which will attract the casual gamer more easily to mobile gaming. At the same time mobile terminals are gaining computing power, and also the user interface is developing to a more game friendly direction. Currently 16% of all of the phones in Finland are equipped with a color screen [Tietoviikko, 2004].

Java based services have been used in Japan since 2001 and it's possible that they will become common quite fast in Europe as well. Java handsets were introduced in Japan in early 2001 and after less than two years, in the end of 2002, already 43% of NTT DoCoMo's subscribers were downloading Java services. [Poropudas, 2002]

3.2.4 Unfavorable Market Trends

Economical Trends

Despite the promising outlook of the mobile developments in general, there are still a few uncertainties that will shape the usage of mobile services. First one is operators' willingness to offer fixed price per Megabyte low revenue data transfer services [Analysys, 2003(2)]. The high cost of mobile Internet connection might pose a problem for the expansion of online mobile gaming and could prevent part of the users from playing online mobile games. To make the transition to packet data transfer easier, operators have already created fixed priced packages that include a certain amount of transferred data. For example TeliaSonera charges 9,99€ per month for a 20MB package and roughly twice that amount for a 100MB package [TeliaSonera, 2004]. The price is still quite high for an average gamer, and it remains to be seen how long they stay that way.

Demographical Trends

Finland has a relatively large number of over 65 year old people and their relative share will continue to grow quite far into the future [StatsFI, 2003]. This means that the share of young people under 30 years old will shrink in proportion. However, the change is quite small and is cancelled by the overall growth of the population to have any significant effect over market outlook.

Technological Trends

Another uncertainty in the mobile market relates to the technology. The selection of which technological solutions to use is a difficult one for both operators and game developers. While from the game developers point of view it doesn't matter which way the device uses to connect to the Internet, a strong diversity amongst the terminal market will make it harder to produce games that will work with a wide set of terminals.

3.3 Market Micro Analysis

3.3.1 Target Market and Growth

The target market consists of young (at the moment Finnish) people aged from 18 to 35 who live in the major cities with population over 100.000. Helsinki and its neighboring cities would be the first place where the game would be played and it would be followed later by Tampere, Turku and Oulu. There are close to 650.000 mobile phone users in Helsinki area and altogether over 980.000 users in the aforementioned cities.[4]

To be able to play online mobile games, in practice a Java based mobile terminal is needed. At the moment 16% of these mobile users also play games with the device, which translates to over 156.000 gamers in the same cities as above and over 100.000 in Helsinki area alone. That figure is also growing rapidly as people are upgrading their mobile terminals into newer ones. As mentioned before, by 2007 45% of these users will be estimated to play games with their phone, which makes the target market size over 440.000 people.

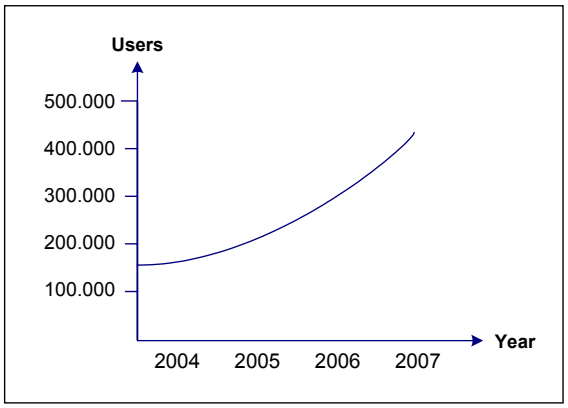

Figure 3.5 The development of the user population with Java enabled terminals

3.3.2 Customer Pain

The online-based multiplayer strategy games at the moment are very time consuming and the player has to devote a considerable amount of time in front of the computer to actually succeed in the game. This means that the more casual gamers and people who can't or don't have the time to sit in front of a computer all day can't maximize the participation to these games.

Mobile Java games at the moment provide a nice way to kill time, but there are no possibilities to play games with a longer time span than just a few minutes or half an hour. Also, while mobile devices are meant to "connect people" mobile gamers can't be a part of a community working towards a common goal.

[4] Calculated from the population and mobile phone users in Finland and proportioned to local population size. [MINTC, 2004] [StatsFI, 2003]

3.3.3 Customer Benefits

Community Spirit and Flexibility

The fact that Geocaching has become quite popular without any major hype behind it proves that games, which mix reality with a virtual world, are very appealing to gamers. The idea of blending the game world with the real one allows players to immerse themselves further into the game instead of just typing and clicking in front of their monitors. Actual participation allows them to experience events first hand when they really happen but they can also choose the virtual participation when it better suites them. Furthermore, the popularity with online multiplayer games and browser based strategy games points that people have a strong need of playing in communities together with other people.

The hybrid mobile game *Dealer* provides players both a possibility to work in a team and also to participate in the game with a slower pace. Dealer mixes a virtual world with real familiar surroundings, which makes it fascinating for players to explore a totally new side of their own neighborhood.

Publicity

As the experiences from the browser based online games shows, the major motive for playing these kinds of games is to get one's own name to the top of the high score charts. To support these needs, Dealer features multiple different ways of getting one's name for everybody to see. The names of the ones who succeed, and of the ones who fail miserably, but in a funny way, will be presented for everybody to see. Also cross media coverage is planned, so that the top players would be featured in a game related TV show, for example Tilt-TV.

Low Entrance Fee and Real world rewards

For playing the game in a very basic level, the customers don't have to pay any subscription fee. This way the customers can get acquainted with the game world beforehand before investing in the game. If they would like to create their own profile into the game, a nominal fee (e.g. 1€) would be charged. Later on customers are encouraged to spend small amounts of money to buy extra services, abilities or equipment to enhance the game experience and to actually do better in the game. Good performance in the game will be rewarded with gifts to partnering services, e.g. movie tickets, so players will have an incentive to invest money in the game.

3.3.4 Viability of the Concept

At the moment there are no products like Dealer available and the concept would enjoy a first mover advantage on the market. In order to succeed, the pricing of the product would have to be on the same level, as other mobile games are at the moment. Downloadable Java games are usually priced between 5-7 € [eDome, 2004] and the price for one game shouldn't be much higher than this on average.

Although there aren't any exact products, similarities can be found for example with the browser based online games. Simple as they are, they provide an excellent experience for the users to enjoy a community-based game, where interaction with others is the key. These games quickly built a large user base, although when Planetarion was commercialized, it as quickly lost almost all of its user population. The reason for the drastic drop in usage numbers was mostly because of the fact that there were so many free alternatives available which did not differ that much from the original concept.

As the case of Habbo Hotel shows, people are willing to pay for an online game, if there are no sufficiently attractive alternatives present. With a simple concept and clear design Sulake Labs has been able to gather a huge number of both non-paying and paying customers.

Whereas the concept of Dealer seems interesting, we must not forget that this document was designed to explore the different elements in multiplayer gaming. In case of an actual successful business case, the idea of offering a drug-dealing game would likely gain huge opposition from clients and competitors, as well as from governmental institutions. Although the concept is questionable, there is a clear opportunity for a product such as dealer. Examples of successful questionable concepts, such as Grand Theft Auto, exist in the market and regardless of age-restriction, they have a great appeal especially with a youth audience.

3.3.5 Possibilities for Expansion

After the concept has been tried and verified in domestic market, it will be relatively easy to expand it abroad. The theme of the game is familiar everywhere, although in some countries there might be moral opposition against the liberal approach to drugs. The concept also creates additional revenue for telecom operators, which makes it easier to create active partnerships.

The share of Java enabled mobile devices will probably be lower in some European countries, but the hugely bigger population makes up for the difference.

3.4 Industry Macro Analysis

The purpose of this analysis is to determine the attractiveness of the target industry for our product. To better understand our industry we will first describe the environment we would be entering and then analyze the possibility of lucrative business on that industry.

3.4.1 Industry

Our product is clearly a mobile game, so we have to consider the product in respect to other mobile games on the market. To make the analysis simpler we think of ourselves from the perspective of a game developer.

The mobile games industry is, however, not sufficient definition for our industry. As seen from the analysis of mobile games industry from the beginning of this paper, the current products have been much more technologically limited than our product has to be to succeed. Therefore, it would be logical to extend our industry to be represented by a phrase: "location-based community oriented mobile games industry". This might sound silly, but targeting this analysis more specific than to mere mobile games industry is seen as an asset for analysing the features that do not currently exist on the market.

The following steps of the analysis are constructed using Porter's five forces model.

3.4.2 Bargaining Power of Customers

The customers of our game have a limited bargaining power that is characterized by their role in the game itself. For a successful game the attractiveness of the product might cause substantial lock-in for the customers. The community that has formed around a game might cause the players to be so closely related to a single product that changing the product becomes impossible. This is seen from the history, as some classical multiple player games (e.g. MUDs) are still popular after a couple of decades of online play.

In an emerging market the customers are an important part of the scenario. The customers are the ones who play the game and they might be willing to team against it if they are unhappy with its features.

3.4.3 Bargaining Power of Suppliers

The most characterizing for this industry would be the role of mobile operator in offering the game service. To be able to deliver the product it might be advisable to use the location-based functions of the mobile network rather than external means, such as GPS. The operators have, at least for now, a very strong position in offering this service as the competition in the field is minimal. On a longer time scale, it is likely that there will be more competition between the operators and the price of the service will go down. Also, a single successful title might have, at least initially, a substantial share of user base of such an operator service, which would weaken the operator in bargaining for keeping the customers.

A community also requires an extensive web platform construction to be built. The construction and maintenance of such a service would be advisable to outsource, as it would likely be outside the core competence of our company. In addition, the task would not require much special skills from the supplier so the number of available suppliers would be large, giving our company an advantage over their bargaining power.

3.4.4 Threat of New Entrants

In the first step our company would most likely be seen as a threat from the existing players' point of view, that is, from the mobile game developers' perspective. Entering the market in the early stage, should however give our company a firm stand against future competitors entering or existing competitors diversifying into the industry.

3.4.5 Threat of Substitutes

The product construction would be unique, so the same product would be nearly impossible to imitate. There is, however, a substantial risk of some other title becoming more popular among the players. This risk is added by the fact that our product is not able to target the whole population, but merely a certain segment that would be interested in playing a game of the described sort.

The substitute products might turn out to be similar location-based community oriented games that would have even more original ideas, or e.g. ideas that target a whole family or players of all ages.

3.4.6 Intensity of Rivalry

From the perspective of this game, the rivalry might offer a substantial risk for the existence of the product. At least the initial user base will be small and having to compete for the available user would be too costly to run a business with.

The customers are clearly the soul of a community based game and attracting them to enter, might cause substantial lock-in and strengthen our position against the competitors. From the suppliers the operator will have a strong role by being able to control the data transfer in the game. There is a risk that the market is not ready this kind of service and that no operator shall offer the location and data services for cheap enough to offer this kind of game in the first place.

3.5 Industry Micro Analysis

3.5.1 Introduction

This analysis studies the business element of building a company around our innovation. Because the market for our product is still only emerging and the variables in the industry are very difficult to determine, this chapter is based on approximations about probable future scenarios. The main focus of this chapter is to search for the inimitable properties that our innovation and the company around it would have among the players of the industry.

3.5.2 Competitive Advantage

The intellectual property rights (IPR), to start with, are increasingly important in the rapid development of the telecommunications industry. Also in the games business, there has been a clear trend towards building strong IPR portfolios into the market. From our company's viewpoint it would be extremely important to be able to create a product that would be worth protecting and in the future possibly even licensing the rights of the product for third party manufacturers of, say different kinds of fan products.

The timing of the product introduction would be an important detail in building the state-of-the-art knowledge for the people involved in the company. Currently there is only very limited amount of competence around the world related to multiple user location based products. Getting a team to develop skills in this area might be an important source of sustainable competitive advantage.

3.5.3 Profitability Analysis

To gain insight on the possible profitability of our business model, we have estimated a number of different factors that affect the costs and sales of the possible product. First we estimate the required input

Because of the immaterial property of the product the variable costs in the production are virtually nonexistent. Therefore the following expenses are based upon possible fixed costs that would occur in the first year of operation. We have estimated that the initial development of a product would require a team of 6 persons.

Table 3.1 Fixed cost distribution for the first year of operation

Expense	***Cost (€)***
Labor costs (12 months x 6 persons x 3 000 €)	216.000
Rent (12 months x 1 000 €)	12.000
Development hardware (5 x 2 000 €)	10.000
Server side hardware leasing service (12 months x 1 000 €)	12.000
Marketing budget	50.000
Other fixed costs (e.g. software and traveling)	10.000
TOTAL	**310.000**

These figures are very rough estimates and for example the marketing budget could be basically bottomless even for purposes of one target city area. The key of the success of this innovation is, however, the attraction of the customers, so that has to be emphasized in the planning of the profitability.

We estimate that developing such a full-scale client-server architecture product with the newest mobile technology would take about a year. The personnel can't be disposed of when the product is ready, so the expense is going to carry on in the future. Also the product maintenance has to be considered but it is left out of these calculations for clarity. With these figures it turns out that the cumulative negative profit for the first 36 months of operation would be 770.000 €. We have used this sum to estimate the expected sales figures for the two years of usage for this single product. For this payback time of 24 months the pure income should be around 32.000 € per month. Naturally the sales cannot be that high initially so we have estimated the sales to constantly rise for the first 12 months and then stabilize for the last 12 months.

The next two diagrams show the development of the expenses with the expected payback time of two years. The first diagram Figure 3.6 on the following page shows the monthly revenue flow and the Figure 3.7 shows the cumulative cash flow for the 36 months of operation.

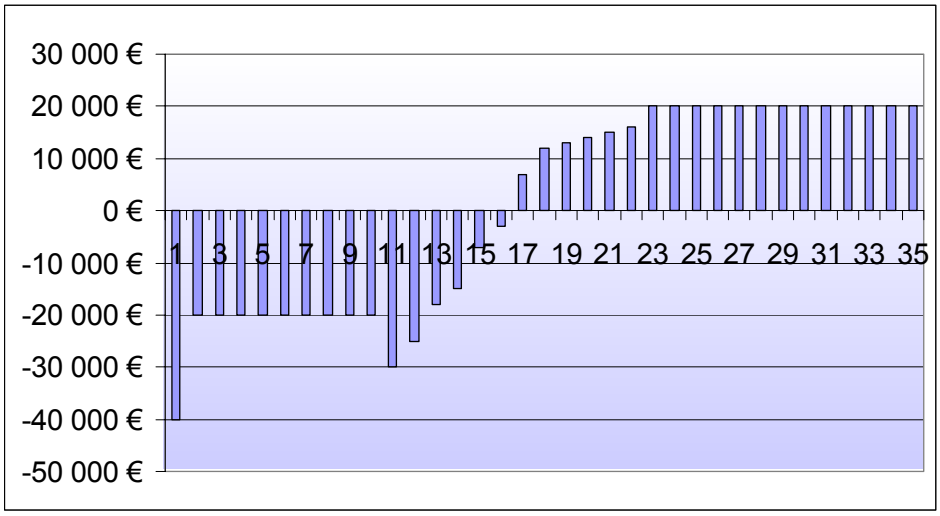

Figure 3.6 Revenue flow for 36 months of operation

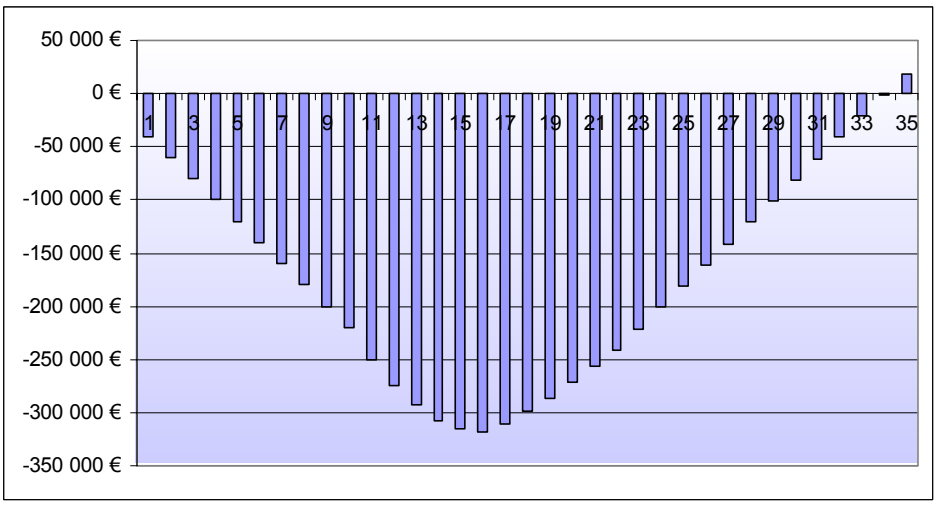

Figure 3.7 Cumulative revenue flow for 36 months of operation

The revenue depicted in this analysis is the revenue for our company. Next we will analyze these figures from the customer's point of view. Taking the average monthly revenue of 32.000 € we would have to collect a customer price that would also cover the expenses for the operator data transmission fees and possible extra charges for the location service. It would be appealing to leave these services between the customer and the operator to solve, but that might have a devastating effect on our business model.

To start with, we have to know the possible user volumes that could be reached. As mentioned earlier the number mobile gamers in the capital region of Finland is around 100.000. With a market share of 2%, that would leave us a total of 2.000 users for game. Using the 45% share of gamers in 2007, we would end up with a figure of roughly 5.800 users.

To build a profitable business we have to have some sort of incoming revenue flows. The three basic parts that have been considered are monthly or game based subscription fees, supplementary services and advertisement sales. To join the game the player would have to pay, let's say, 1 euro to register his or her character. This would be enough to play the game to the fullest but the supplementary services, like different jewellery and clothing, would personalize the players' or gangs' avatars or possible give the player an advantage in the game play (such as with weapons or with more detailed information). We estimate that the sales for such services could be around 4 euros per user per month. The users would like to see at least most of their purchases to be saved between games so the service offering would have to continuously diversify to support a constant demand for these services. Finally, the advertisers should find it profitable to offer targeted advertisements to people using their location data. By tying these advertisements to be a part of the game play it might be comfortable for both parties to send and receive these ads. According to our own estimates a level of around 3 euros per user per month might be received from the advertisers.

According to these calculations we'd end up with a monthly income of 8 euros. The 4 euros per month for a single player might sound quite high but is in line with the market price for multiplayer on-line games. Partnering with the operator for the location service fees might help us to minimize the operator's per-user expense. Leaving the data transfer fees to be decided between the operator and the customer might be possible as there is already a great amount of competition in the field and the customers usually find the solutions that are best suited for their usage needs. Now the location service could be left to be a part of the 8 euros for, let's say 1 euro per user, leaving a 7 euro monthly profit per user.

Table 3.2 Estimated income and expense per user per month

Income per user	
Registration	1 €
Supplementary services and items	4 €
Advertising	3 €
Total	*8 €*
Expense per user	
Location service	-1 €
Total	**7 €**

With the calculations above, the user rate would have to increase into a sustainable level of 6.000 monthly players to make the business profitable. We can quickly calculate that with the current share of the mobile users that also play games, the city would have to be three times bigger than metropolitan Helsinki (roughly 3 million inhabitants) to give a reasonable user base. In 2007 the situation would be a bit different when even a city the size of Helsinki would offer possible market for this product. However, the figures suggest that internationalization would be the only viable alternative to build a business around the described innovation.

4 CONCLUSIONS

Dealer draws upon ideas from existing games as analyzed in the beginning of this document. The group has tried to identify those elements that hade made Geocaching, Mogi and strategy games successful and integrate them into Dealer. The central ideas of trading and teamwork are present in many successful games. Matters such as the playability of Dealer are impossible analyze or even present in a theoretical manner. Therefore the group has concentrated on describing the basic ideas and rules behind Dealer. There is no reason to believe that Dealer couldn't function as a successful game, even on large-scale.

Dealer relies very strongly on the community aspect. Much of the content and the entire game play comes directly from other players. The atmosphere of playing Dealer is directly related to the atmosphere within the community. Dealer also tries to learn from existing game communities and community games. Many ideas can be borrowed from current practices, but Dealer also introduces new challenges for dealing with communities. The combination of location-based "live" playing and computers for a long-term, large-scale game doesn't really exist yet. Therefore it is impossible to say what kind of issues will rise when building and maintaining the Dealer community.

Altogether a different issue is the feasibility of Dealer as a business idea. Since the game genre, mobile location-based multiplayer games, doesn't really exist yet it has been difficult to find concrete figures for potential markets and revenue per user. The assumptions are based on available figures from similar genres such as mobile gaming, computer gaming and location-based gaming. In addition the group has used forecast data from different companies on the developments of the mobile game markets.

From the figures presented above it can be seen that Dealer would not be a successful business idea for the user base available in Helsinki. What is needed is either a larger city, a very large market share or a larger audience willing to play games. It can be argued that Dealer represents a new type of game and would thus break existing barriers and categories. If started now, Dealer could perhaps be brought to market before any competitors can make it. This would bring a first-mover advantage, but it still might not be enough to form a profitable company.

To meet the challenges in forming a lucrative business around the game, the most crucial part of the financial structure is the co-operation with third-party partners. With a semi-criminal drug-related game, gaining successful business partners will certainly be difficult. Seriously speaking, dealer should be seen more as a conceptual framework than a directly implementable product.

Dealer can be seen as an interesting concept that would be worth a more detailed analysis. The group sees a growing trend in games such as Dealer which combine elements from many traditional forms of gaming in a new way. There are signs that these kinds of games will be big in the future. It remains to be seen whether or not Dealer is among those games.

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Promotion of Computer-Mediated Communities

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Abstract

Mobile devices are changing the landscape of communications. They continue on the path started by personal computers and the Internet. Now also electronic communities are being formed. This development will open possibilities for commercial communities, but the knowledge about promotion of computer-mediated communities is still scarce.

In this paper a model for selection of promotion method type is developed. The model is developed by analysing various features of 21 recognized promotion methods, which are divided into five different categories. The analysis is supplemented with an interview of an industry specialist. The final model uses seven features to differentiate the five categories of promotion methods.

The model is indicative and should not be used as such, but merely as starting point for further analysis. Another interesting topic for further research would be the impact of the always-available communication tools on communities.

1 Introduction

1.1 Background of the study

This study analyses promotion of computer-mediated communities. Development of mobile technology has made it possible to create also communities, which are used with mobile devices. Therefore the analysis is constantly comparing "traditional" computer-mediated communities with these new, evolving mobile communities.

1.1.1 Mobile communities as future service

Mobile phones have changed our understanding about possibilities of communication. Earlier communication was either one-way like radio broadcast or bound to a specific location like telephone. Mobile communications networks have changed the way people communicate. Almost everyone has a device, which can send and receive signals. Received signals can contain rich content, for example voice, text, pictures, real time video stream or web content. Mobile phone is at the same stage as the computer industry was 5-10 years ago. In the early 1990s computers were connected to communicate with each other and now mobile phones are developing from speech communication equipment towards multimedia communication devices. These future devices have features of phones, computers, digital television and personal digital assistants (PDA).

In the late 1990s computer networks became common enough to enable people to communicate between each other using computer networks. Bulleting board services were the first popular services leveraging the technical development. Users were able to change opinions in these bulleting boards. After the first stage the number of computer users increased fast and closed services changed to various open network services such as e-mail.

Mobile devices are now facing the same development as computers some years ago. Leading vendors introduce new mobile phones in which the ability to make telephone calls is not the essence. Digital cameras, gaming devices, radios and keyboards are integrated into mobile phones. At the same time mobile network technologies are evolving and networks can provide higher data rates to users than fixed computer networks could at the time they were in same evolutionary stage.

Timing is important aspect in service development. Now it is time to develop services, which can take advantage of the new mobile technologies. The market is open for commercial innovations such as Google and Hotmail were in the fixed line computer networks.

Mobile phones are personal devices and their traditional use is to connect people with each others. Therefore it can be assumed that new services will concentrate on communication based services, such as

communities. Computer networks have shown the power of computer-mediated communities. For example the global Linux development is based on several communities and the project has shown the power of communities. A mobile phone is more personal than a personal computer and has more capabilities in the field of communication.

1.1.2 Promotion as part of marketing

Kotler (1997) developed the marketing model, which is based on four P's, namely Product, Price, Place and Promotion. This model has been widely used in designing marketing campaigns of new products. This study examines promotion, which comprises all activities which helps the marketer to express his offering to the potential customers. These activities include presentations, advertising, sales activities, media relations and direct marketing campaigns. Basically promotion is only about communicating with potential customers using various instruments and channels.

Communication is never perfect. The impression the sender has about the message may differ significantly from what the receiver understands. Misunderstanding is possible even although the actual content of the message has not changed. External noise can affect the understanding of the message.

The most important steps for planning communication are the selection of the target segment, defining the objective of the communication, budgeting the campaign, planning the message, selection of channel for broadcasting the message, selection of the communication tools and measurement of the results.

1.1.3 Structure of the study

The purpose of this study is to examine marketing of new community based services. These services are based on the sociality of people, which affects the marketing of such services. The scope is limited to promotion, which is one part of marketing.

The first chapter of the study discusses the subject generally, the research problem, the goals of the research and the research methodology used. The second chapter explains more carefully the way data collection is performed. The third chapter presents and analyzes the recognized methods for promoting communities. The fourth chapter contains the results from the interview, which concern promotion of computer-mediated communities and the model presented in this paper. The fifth chapter summarizes the gathered information from the previous chapters and presents a model for selecting a suitable promotion method. The sixth chapter analyzes the relevance and reliability of the results and outlines topics for future research.

1.2 Research problem

The development and maintenance of computer- or network-based services is not free. Therefore there must be usage for the new services in order to be reasonable to develop such services. Creating a critical mass of users is very important for communities because the value of the services comes from the other users of the community. The more users there are the more social connections the users can establish and the more information there is available from the other members.

The operator of a community has to think how to create the critical mass of users for a new community and what really attracts the potential users. Marketing is a tool for this challenge.

The research problem of this study covers the utilization of marketing tools for promoting computer-mediated and mobile communities. What kind of effects do different tools have for target segment members?

1.3 Research objectives

The main object of the study is to create a high level model, which helps to evaluate the suitability of different promotion methods for marketing computer-mediated and mobile communities.

The study tries to recognize a wide group of different promoting methods and then to analyze these methods. The final model is created using the results from this analysis. An industry expert interview is used to verify the results of the analysis.

1.4 Scope of the study

The different promotion methods are identified in only one session and the expert interviews are limited to one because of scarce resources. This means that the model will be based on very limited information, but

probably this is still enough to create a high level base model to specify the most common options. Future research should try to identify more promotion methods and then test the developed model using more expert interviews.

1.5 Research methodology

The purpose of this research is to sketch various methods for promoting new communities and after that create a model, which helps the marketer to choose a suitable method for a particular case.

The RiskIt method presented in Kontio (1997) describes a brainstorming method, which is used for identifying risks in software projects. The brainstorming method is suitable for cases, in which the idea is to identify a large number of ideas as basis for further analysis. In this work brainstorming method is used for finding different community promotion methods.

After the various promotion methods are recognized, they are analyzed using selected criteria. After the analysis is completed, a model for choosing a suitable promotion method is created. The model helps to select a suitable promotion method for different communities.

To validate the results from the analysis, a community expert will be interviewed. The expert has a long history in computer-mediated communities and community promotion. The purpose of the interview is to compare the expert's opinions about promotion methods with the results of the analysis and in that way confirm the correctness of the source information used for building the model.

2 Data gathering

The purpose of the data gathering phase was to identify as many different community promotion methods as possible. Internet communities were suitable as a start point, because in the Internet different methods have been used for promotion and many different technological limitations or challenges have been solved or bypassed.

Data gathering was performed in a brainstorming session, which was held in Otaniemi, Espoo on 21.4.2004. Prior to the session, the participants gathered information about marketing and promotion of communities. During the actual brainstorming session both participants used the first 20 minutes to write down promotion methods which could be used in marketing of computer-mediated communities. Each piece of paper held one method. After that all the recognized methods were analyzed, overlapping methods were removed and similar methods were combined. In this way 21 different methods for promoting computer-mediated or mobile communities were found, which were then categorized into five different groups. The methods are introduced by more detail in the next chapter.

During the analysis nine features of each method were analyzed. After the analysis the averages for each group of methods were calculated and these averages were used for specifying the common features of the methods within each category. Using this method it was possible to recognize the most meaningful features, in other words those that differ most between the various categories.

Based on the session also the questions for the interview were created (see Appendix A). In this case there were only one experienced community expert interviewed. Results of the interview are presented in Chapter 4.

3 Analysis of different methods

As result of the data gathering 21 different methods for promoting computer-mediated communities were recognized. Next these methods will be described more closely and analyzed based on the following features:

- definability of the target group,
- reach of target group,
- economic cost,
- repeatability,
- complexity of the implementation,
- sociality,

- morality,
- content of the message and
- control over the message.

Definability of the target group means how well the audience to receive the message can be controlled using the method in question. This is essential if the unit cost of sending the message is high, as in these cases it is important to send the message only to those persons, who are seen as most potential from the viewpoint of the community. *Reach of target group* indicates the ability of the method to reach all the members of the target group. This is important if the size of the target audience is small, because in these cases a great acquaintance in the target audience might be needed to gain enough members to the community.

The *economic cost* refers to the cost of the used method. Many of the founders and operators of computer-mediated communities are small companies, which do not possess vast economic resources. Therefore they need to take the involved costs into account both on the relative and absolute level when developing their marketing strategy.

Repeatability stands for the ability to run the campaign several times. Often the best results are achieved when the same method is repeated numerous times. In these cases it is beneficial that the method can be easily replicated. Similarly the *complexity of the method* tries to evaluate how difficult it is for a small company to use the method, that is, how much help it needs from external experts when deploying the method.

The substantial issue behind all communities is the need for people to feel belonging to some group and willingness to communicate with other people. Thus it is beneficial for a method for promoting a community to appeal to the *sociality* of people. When utilized efficiently, the target person sees that his or her friends are already part of the community and thus it would be beneficial also for him or her to join the community. On the other hand, *morality* reflects the methods of promoting a community from the viewpoint of persons moral. There might be suspicious features involved in some of the methods, which can lower the willingness of the members of the target group to join the community.

The *content of the message* indicates the ability of the method to communicate a message to the target audience. In some methods a clear story can be transmitted to the target audience, whilst in others only the name of the community or the company behind the community is communicated. Different types of messages require different media. The *control of the message* refers to the ability of the operator of the community to influence the content of the message sent to the target audience. If this ability is weak, there is a major risk in misunderstandings and thus unsuccessful communications.

The identified methods for promoting computer-mediated communities have been divided into five groups, which are

- traditional advertising methods,
- methods utilizing electronic services,
- methods traditionally used in promoting communities,
- cooperation based methods and
- event based methods.

Next these groups and the methods identified in each of them are presented. The results of the analysis have been concluded at the end of the chapter for building a model for selecting the appropriate group of methods.

3.1 Traditional advertising methods

Traditional advertising methods refer to methods commonly used for promoting products and services in almost all markets. These are strongly based either on promoting the name of product or service in question or simply broadcasting a simple message from the seller to the potential buyer of the product or service. Typical for all the methods in this category is that they do not take advantage of the social networks among people in conveying the message.

The most important benefits of these methods relate to the control of the message. The message can be very complicated and still the communicator can be ensured that the message does not change during the

transmission. There is no difference in how these methods suite to promoting different kinds of communities.

3.1.1 Television or radio advertising

Television or radio advertising refer to traditional advertisement campaigns carried out via television or radio broadcasting networks. These are very efficient methods as they reach easily a very large audience and by leveraging the knowledge of the industry specialists, it is also possible to efficiently reach the correct target audience.

The largest problem involved relates to the cost and complexity of the campaigns. The advertisements are quite expensive and the deployment requires industry specialist. Furthermore the method does not leverage social networks for passing on the message.

When analyzing the method for promoting mobile communities, the disadvantages are highlighted as most of the operators of these communities are lacking the needed resources.

3.1.2 Newspaper or magazine advertising

Using newspaper or magazine advertising as a tool for promotion is commonly not as efficient in reaching people as television or radio advertising, but respectively the monetary cost attached is lower and the campaigns are easier to implement and can implemented even without external consultation and resources.

In promoting mobile communities newspaper and magazine advertisements are more usable than television and radio advertisements due to the lower costs and easier implementation.

3.1.3 World Wide Web advertising

World Wide Web advertising means using so called e-banners for promoting products or services in the Internet. Banners offer a good medium for promoting computer-mediated communities, because the target group is reachable using the Internet. Also the costs involved are modest, the campaigns are easy to reproduce and the implementation does not require excess usage of external resources.

This type of advertising is best suited for promoting computer-mediated communities, but is suitable also for mobile communities. The main difference is that the mobility aspect of the community is not directly present when the campaign is developed to the fixed line network.

3.1.4 Free goods

Another traditional method for promoting products or services is the distribution of trade gifts to potential customers. These gifts can be many different kinds of low-value products, such as pens, rubbers or stickers. However, the similar results can be achieved also using more valuable products such as overcoats or suitcases. The problem involved is the cost of the campaign, because the gifts need to be of good quality so that the customer does not get dissatisfied to the quality of the community even before actually experimenting the community.

The most significant problem in the method is the limited reach. If the gifts are valuable, there will be large interest towards the gifts also from outside the actual target audience. This can lead to an unsuccessful campaign as the gifts are delivered outside the target group and thus there is no effect among the members of the target group. Because of these reasons it is very important to plan the distribution of the free goods efficiently when using this method. However, this is not possible in all cases.

Technically the method is very easy to deploy, but there might be some ethical issues involved, if the gifts are of larger value. There is no major difference in using the method to promote mobile communities instead of computer-mediated communities.

3.1.5 Multi-channel marketing

In multi-channel marketing the idea is to combine two or more of the previously presented methods and thereby create a message that is delivered to the customer via several different channels. The campaigns can be implemented in many different ways, but to reach efficient results, some external consultation might be needed in formulating the message and tailoring the message according to each of the methods used.

External consultation typically requires monetary resources, which might be problematic for operators of computer-mediated communities. Otherwise all the features are similar to the other methods within the group. Using the method for promoting mobile communities requires only a different selection of the message.

3.2 Methods utilizing electronic services

From the identified methods five could be categorized under the title methods utilizing electronic services. Some of these methods utilize Internet for transporting a message, others to attract potential users to familiarize themselves to the community by using different kinds of services.

3.2.1 Attraction service

This method refers to services offered at the community, which attract the customers to familiarize themselves with the community. An example would be a photo album service, which is offered for the members of the community. Anyone can browse the photos, but only members of the community can publish their photos and create albums.

The problem involved is that the service may draw people to join the community even though they are not planning and willing to actually participate to the community. They just join to gain the membership benefit. This method is easy and can be easily replicated, but the content and control of the message are poor. However, the system is based on social networks, which is positive.

The method can be used also for mobile communities. The challenge is to create services, which draw the attention of mobile users, since currently the number of successful mobile services is very limited.

3.2.2 Send link –feature

Send link –feature is commonly available in different Internet services. With it the user can send information about interesting content to other persons potentially interested. The model is based on social networks and typically it can also be assumed that the person to whom the link is sent to is also interested in the subject of the information. Therefore he or she is a very potential candidate to join the community.

The method is easy and cost efficient to implement and makes it possible to control the message sent out to potential new members of the community. The disadvantage is that the method will not create large information flow fast, because people use the link feature only on special occasions. For mobile communities the usefulness of this concept cannot be evaluated before there is more information about the possibility to create links to mobile phones.

3.2.3 Chat services

The use of chat services as a promotion tool does not refer to offering a chat service for the public as that would belong to category 3.2.5 Free services. Instead, chat services can also be used in an innovative way to promote communities. The idea is to share own experiences about the community using chat services such as IRC as a way to get in contact with people.

The method is very new and not much utilized yet. However it may be very efficient, because it is able to reach the right persons e.g. persons who are potential to be active in communities they participate. Especially mobile communities may be able to use this method to inform potential members of the new community available. Many of the people interested in mobile communities might not be aware of the birth of such communities and chat services may be one of the best ways of approach them.

The method is labour intensive and cannot be easily replicated, but the content of the message is under tight control. Furthermore the method relies on social networks, but some people can see it as somewhat unethical and could therefore also create negative publicity for the community.

3.2.4 Network visibility

Network visibility refers to creating awareness about the new community by making the community visible in different services and portals. In practise this may mean a number of things, for example presence in various lists of links and portals. The methods makes it possible to reach the target audience cost efficiently, but the method is not very replicable and requires heavy compromises about the content of the message.

The method is not utilizing social networks. It suits best for promoting really unique offerings, for which reason it might be extremely well suitable for mobile communities, as these are new and interesting concepts.

3.2.5 Free services

This method relies on services offered free for anyone. The idea is that the free services would encourage people to familiarize themselves to the community. Such services could be for example free SMS-messages

or e-card services. The method makes it possible to reach a large target group, but there is no way to control whether the people belong to the target audience or what kind of message is delivered to the potential members of the community. The method can equally be used for promoting computer-mediated and mobile communities.

3.3 Methods traditionally used in promoting communities

The third group of methods consists of those methods, which have traditionally been used in promoting different kinds of communities. These are not bound to the nature of the community and therefore they are suited for all communities, whether they are virtual or not. Therefore they are not analysed separately for computer-mediated and mobile communities. The methods commonly rely on the human nature.

3.3.1 Exclusivity

Communities, who limit their membership only for invited members, have existed for ages. Exclusivity is basically not a promotional tool, but as it often makes the communities more interesting for outsides, can it be analyzed as a way of promoting the community. Often an exclusive community is viewed as elite and therefore as something you want to belong to. From the implementation point of view the method is very easily adopted, but the message sent by the method cannot be controlled and can be different for various people.

3.3.2 Word of mouth

As exclusivity, also word of mouth is an old concept not originally targeted for promotional purposes. However, as the spreading information creates an image about the community, word of mouth can also be analyzed as a promotional tool.

The method is based on the people's willingness to share information about their experiences to their friends. The challenge with the method is that it is almost impossible to deliberately utilize the phenomenon. However, if the process can be enhanced, it is a very powerful way of sending a message, because the receiver of the message has a trust relationship to the sender. However, it is not possible to influence the message communicated about the community.

3.3.3 Membership benefits

Many communities offer different benefits to their member. Such benefits can be magazine subscriptions or T-shirts. The idea is to lure people to join the community, but the benefit is mostly targeted to the persons already members of the community. Therefore this is not a direct method for promoting the community, but again, as the membership benefits influence the attractiveness of the community, the method can be analyzed as a promotional tool.

The problems with the method are that it can be very expensive and that it does not automatically contain any messages about the purpose of the community.

3.3.4 Network marketing

Network marketing is a formalized version on word of mouth. It means that the community offers benefits to the members, who attract new members to the community. In this method the community can better control the message send by the recruiters, but if the members of the target audience are aware of the benefits for the recruiters, they might see this as unethical or at least disturbing. This questions the morality of the whole community. However, the method reaches well the members of the target group and the costs are modest.

3.3.5 Public visibility

Often publicity is one of the key elements of successful communities. Therefore public visibility is a key element in promoting any communities. It is not easy to gain, but success will bring fast numerous new members to the community. Public visibility can be gained by giving out public statements or by having a public person speaking on behalf of the community.

The method is inexpensive and has a wide reach, but a challenge may reside in controlling the message. Media has the ultimate power to edit the message according to their personal needs and thus the risk of an erroneous message is valid. Also often a person already known by the media is required to gain publicity.

3.4 Cooperation based methods

The fourth group is formed out of methods based on cooperation between the community and some external party. These are based on the idea, that the cooperating partner has some existing connection to the target audience and this connection can be utilized for sending a message about the community and its purpose. As the methods based on cooperation are not based on any specific technologies, there is no difference between computer-mediated communities and mobile communities.

3.4.1 Cooperation with associations

Cooperation with associations means that the association is transformed into a computer-mediated community. For instance some small company with the required technology could offer the Finnish Basketball Association the possibility to jointly operate a computer-mediated community for all Finnish basketball players. As the association has a connection to each of its members, the method has a good reach. And as all the persons are already members of an association, they have already shown the willingness to belong to some community.

Using the method the content of the message can be well controlled. The largest challenges will be the terms of cooperation, because they might be demanding something for the contact to their members.

3.4.2 Cooperation with companies (customers)

Cooperation with companies can occur on two different levels, either customers or employees of the company. If the targeted group are the customers of another company, then the greatest challenge will normally be the terms of cooperation. For the company the customers are very valuable for which reason they need to protect this asset at any cost.

If cooperation is reached with terms acceptable for both companies, can the target audience be reached very efficiently and the message can be held under control. However, as the customers of most of the companies do not know each other's, there is not similar social pressure as with associations.

3.4.3 Cooperation with companies (employees)

Another way of cooperating with a company is to select its employees as the target audience. In this case the cooperation may be easier as the risk for the company offering the contacts is not as large as in the previous case. However, there is a cost for this: the group of people available through this kind of cooperation is not as homogenous as in the previous case. Otherwise the method is very similar to the previous one.

3.5 Event based methods

The last group of methods are based on promoting the community at different kinds of events. The advantage of events is that a personal contact to the members of the target audience is possible. This makes the methods more social then most of the other methods. The presence allows also closer control of the message. And similarly to the previous group the methods are not based on any specific technologies and thus there is no difference between computer-mediated communities and mobile communities.

3.5.1 Exhibitions

Exhibitions are events that are meant for companies to present their offering. The events are organized by industry organizations and specialized companies. They gather different stakeholders of the industry both as exhibitors and visitors. Exhibitions are organized on very different scopes and the most important issue in attending an exhibition is to find the correct event for your own target audience.

At the right exhibitions it is possible to make contact with important leaders of the industry and influence them on a personal level. The challenge with the method relies in the arrangements, because exhibitions typically require quite massive arrangements and a presence for the whole duration of the exhibition.

3.5.2 Public events

Public events are open to everyone and they are organized to promote some product or service. These events can be concerts with strong sponsoring or test events of a physical product. The challenge in the method is the limitation of the audience, because open events are open to everyone and thus there are no ways to ensure the connection of the audience to the promoted product or service.

Additionally the events are commonly costly to arrange and difficult to replicate. However, due to the nature of the events it is possible to get into personal contact with the members of the target audience and therefore efficiently communicate and control the message.

3.5.3 Targeted events

Targeted events are similar to public events, but the audience is more selected. The challenge is often the selection of the right people, that is, how to get the attention of the target audience but not any others?

Examples of such ways could be a presentation of the Nokia N-Gage gaming deck at a technical university or an autograph session of a famous basketball player at a youth tournament. In both cases a certain target group (20-25 year old men interested in technology or 15-20 year old people interested in basketball) can be efficiently reached without massive arrangements. For a targeted event the costs can be much lower and the contact to the new potential members more personal.

3.6 Summary of methods

All the presented methods for promoting computer-mediated or mobile communities have been analyzed according to all the presented features. The analysis is based on the personal views of the researchers and is as such very subjective. A scale from 0 to 3 was used, in which 3 meant a great value and 0 a non-existing value. From the table can be seen, that a television advertisement is very complex (value 3) and not at all social (value 0) method for promoting a community. The table of all the methods, features and the used values are presented as appendix B.

From the analysis it was easy to notice that there were similarities between methods in each group. This observation was used when developing a model for the selection of a method for promoting computer-mediated communities in chapter 5.

4 Industry expert evaluation of recognized methods

The interview was conducted with a person, who has actively been engaged in five different computer-mediated communities. He has organized events and taken part in recruiting new members to the communities. The interview was based on open questions and the conversation continued after the answers. Questions performed during the interview are presented as Appendix A. The results of the interview are presented in same order as they were collected during the interview session.

Interview was conducted in Otaniemi, Espoo on 24.4.2004. The interviewed has experience of operating, developing, and taking actively part in five different communities. Ville Rissanen performed the interview.

4.1 Promotion of new community

According to the specialist, over-promoting does not automatically work. Promoting should be done by the rules and values of the community. Core values should be taken into account when recruiting new members, because the values are motivators for members to feel being part of the community. Spirit and attitude are also important parts of the community and they should be noticed.

Evolution of communities contains a phenomenon of changing the community's original subject matter by covering also other subject while time passes. For example, a community focused on computers could start to discuss music the members are listening or games they are playing. From the community management point of view this phenomenon has an influence for limiting the subject of the community. Tightly determination of subject area is impossible. Communities must have space to move, live and evolve.

A member, who is sponsored by a company, should tell honestly that he or she is representing a company. But in a community all members need to represent themselves as individuals, not aggressive company employers. If commercial interests are too clear, then the members feel themselves artificial and discard the community. Members have to feel that people instead of commercial institutions have made up the community. Companies can be a part of the community, as example by being a sponsor or service provides and not a controller. Member registration has no influence on the popularity of a community, but the members should be possible to discuss anonymously to make the community popular.

Promotion should not underestimate the intelligence of current or potential members. For example propaganda in a chat room may be underestimating. On the other hand, there are exceptions of this member intelligence rule. Teenagers may be exited about some TV-advertisement and decide to join the community. Creating wrong presupposes about the community as promotion is doomed to fail, just like in

traditional product business. Members may feel that they have been misled. Influence of the cheat could be even bigger than in product business.

Sponsors can support communities, but there are always members who will not like the sponsors and thus refuse to participate in the activities of the community. Companies can create a distinct image of their actions by participating actively on community events. However, always the purpose of developing a community is not to increase the number of members indefinitely.

4.2 Methods for promotion

Word of mouth –method is commonly known and very powerful method for marketing and especially promotion. This method works for products, services and communities. Word of mouth can work also backwards, that is carry negative messages and it works very efficiently in this way too. An electronic version of this method is also available. In it people send information to their friends and half-acquainted persons. This should not extend to "*spam*", because it will harm the development and reputation of the community.

Distribution of brochures and notes is also used in community promotion. The method consists of participation on different events as an exhibitor or as active visitor. The strength of this method is its affordability. Furthermore, a well-selected event can bring a lot of new members to the community. The weakness of the method is its time consumption of participators and still the result can be a lot of paper trash and no new community members.

Advertising communities is possible by participating chat or news services of other communities and informing there about the community news. This method stipulates cautious actions. If members of the other community blame the visitor as a "*spammer*", this will harm and weaken the interest of the target people.

Participation in industry events and active informing about the community at such events is important promotion. This strengthens the community among its current members and increases the member count. There is also a more aggressive version of this method available. The aggressive version consists of dressing up like a SWAT-team in an event arranged by another community. This kind of campaign gets publicity in the event and people will hear the message. Public media can also get interested about the event and that gives the opportunity to spread out a message. The message can be targeted just to the right people and the scope can be very broad, especially if public media get interested in the subject. The weakness of the method is the risk of misunderstanding, as the event could easily be understood wrong and then it gives wrong impression about the community and its members. Manageability is also a weakness. The method could be applied on live TV broadcast to gain maximal visibility.

Some communities paste stickers on walls and pillars, and in that way message themselves to the public[5]. The stickers tell nothing for outsiders, but are important for the members of the community and could even be compared with religious symbols. The strength of this method is its effect to increase commitment between the members. Visibility and targeting of the stickers is a weakness. The area, where the stickers are posted, could be different from the area, where the members are. Stickers are not a method for recruiting new member. The meaning of these stickers is obvious only when a person has already seen the symbol at some community event. After that the member can link the symbol to the community. The morality of the method is questionable, because in some countries and cases pasting stickers is forbidden by the law.

Sending rumours about a community and its activities has proved to work. For example in the Blair Witch –case the rumours worked well[6]. In this method a message is sent as a rumour and after that the service or product is publicly announced. The strengths of this method are its affordable price and that people create expectations about the actual product. If the product does not meet customers' expectations and needs, then the disappointment may effect the development of the community. The effects on the community may be wider than on traditional products. Customer may buy products of the same manufacturer even though earlier products were not able to fulfil their expectations. If a community member gets disappointed or feels that he or she has been cheated, then the member will not participate on any community events.

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[5] This method was mentioned on a BBC television program.

[6] More information about The Blair Witch Project is available at http://www.blairwitch.com.

There are methods in which a company hires members of the community to maintain the community. This can serve the business of the company, for example, if the company is selling products to the community members. Lucas Films has hired fans of Star Wars to establish and maintain a community. They arrange meetings and other events for the members and they are connected to the fans and members of the community.

4.2.1 Five best methods

1. Word of mouth[7]
2. Chat services
3. Network visibility
4. Public visibility
5. Targeted events

4.2.2 Pros and cons in different methods

The word of mouth method occurs in low level and is truthful promotion. People do not recommend poor communities or services and they do not tell good messages about poor communities or vice versa. It is very likely that the right target group gets the message. People use to talk about specific topics only with those, who know or are interested in the subject. The weakness of the method is the manageability of message timing. It is impossible to control when the message has reached the target. The scope of the method may be constricted and right persons will never get the message. Control of the message content is very challenging, because people are good in changing and manipulating messages by accident.

The chat services method is interactive and on unclear things answers can be sent directly. When compared with the word of mouth method, the control over the message is much better. The scope of the method is restricted even more than when using the word of mouth method, as one person can only discuss with a few people during a limited time. As the messages are not lasting, the visibility is not lasting either. Only a few people read old messages and conversations.

The network visibility method can provide lots of information for the potential customers. It is important that enough information is available and that the information is current. Flyers on the homepage do not create any additional value for the potential customers. The method is not cheap, if advertising on the web or other media is needed.

The public visibility method assures wide range of the scope. If the method is implemented in the right way, it strengthens the community. Members of the community feel that other people have noticed them too. The method is quite cheap. Public visibility is hard to arrange because it requires connections and sales skills. Otherwise the public media is not interested about the community.

The targeted events method confirms community very much and this enhances activity of the members to take part of the community events. The method confirms the word of mouth method effects, when members talk with other people about what they have done recently. Targeted events are not the best option when recruiting new members, because only members are normally participating the events. This method is not the cheapest when time and money spent is taken into account.

4.2.3 Risks associated in different methods

The biggest risk is related to the public visibility, because radical action could be misunderstood and then activities the community arranges are seen from a wrong point of view. Another big risk is related on the content of the message in the word of mouth method, because the message can change a lot while it transfers from people to people. There is also a risk related to the chat services method. If someone is heading persistently toward his own opinion, nobody feels comfortable in that community. There is potential for "*war*" between the members and that will not increase the reputation or popularity of the community. On the other hand, it is possible that members establish a new community, which consists of the people with same attitude and idea, when they have been disappointed with the other community.

Network visibility may contain wrong information, but this risk relates for almost all methods, where receivers understanding of the message can be change during the transfer. Risk on the targeted events is related to the individuals, who might make trouble on the event. This is comparable of worst in electronic

[7] Word of mouth is the most efficient method. However, it needs to be taken into consideration that the method works only until a certain number of members. After that other methods are to be used.

messaging. Members' interest of community events decreases and organizers are not motivated to arrange any new events.

5 Model for selecting promotion method

From the analysis of the recognized methods for promoting computer-mediated communities it was noted that morality and limitability of target group were features, which did not differ between the various groups. Therefore they were left out of the model. This is quite obvious, because morality does not have values: a method either is moralistic or not. Limitability of the target group varies too much within the groups of methods to be able to influence the selection model.

Additionally it needs to be noted that the complexity and monetary cost are valued vice versa, because they are negative features. This means that a high value in cost or complexity is seen as a poor grade.

Therefore, there are seven features affecting the selection of promotion method. The table presented below is conveyed from the table presented as Appendix B. In the result table the positive fields are marked with green and the negative fields with red. For example the repeatability and control of the message features are very good and the monetary cost and sociality features are very poor for traditional advertising methods

Table 1. The categories in relation to relevant features

	Reach of target group	Economic cost	Repeatability	Complexity of the implementation	Sociality	Content of the message	Control over the message
Traditional advertising methods	++	---	+++	--	---	++	+++
Methods utilizing electronic services	++	+	++	--	-	+	-
Methods traditionally used in promoting communities	+++	+	+	-	+	+	--
Cooperation based methods	++	-	-	---	-	+++	++
Event based methods	+	--	--	--	++	+++	+++

The values in the table are reached by using the average of the values within a group and by transforming it to plus and minus signs using the translation table. The translation table for the positive features is presented below.

Table 2. Transformation of averages to grades[8]

Average	Grade
3,0 – 2,5	+++
2,4 – 2,0	++
1,9 – 1,5	+
1,5 – 1,1	-

[8] Complexity and economic cost are negative features and therefore they receive the opposite grade.

1,0 – 0,6	--
0,5 – 0,0	---

This model can be utilized, when there are specific requirements for the promotion method to be used. A suitable group of methods can be selected from the table, when the required features are known. For example, if it is important to ensure that the message received by the target persons is the same as send by the originator, then the best suiting methods are in the groups of traditional advertising methods and event based methods. On the other hand, if a good coverage of the target audience is required, the methods used traditionally in promotion of communities work best.

The model highlights the strengths and weaknesses of each of the groups of methods using colours. The used coding is different for positive and features, because the larger values were overrepresented in the analysis. The green cells display the positive features of the groups of methods and the red cells the negative features.

When evaluating the differences between computer-mediated and mobile communities, it is clear that the differences will not arise in this level of analysis. There are some differences between computer-mediated and mobile communities, which definitely have an impact on the selection of a promotion method, but those differences are more between methods than between groups of methods.

6 Validity and reliability analysis

6.1 Validity

It is notable that the success of the various methods is heavily dependent on the community. There are no methods suitable for all cases and also the resources available influence the selection of the method heavily.

Another important aspect is that promotion is only one part of the marketing mix described by Kotler[9]. The selection of the promotion method is dependent on the choices made regarding the other important issues of price, place and product. If any of these issues is analysed without taking the others into account the results are at best sub-optimal.

6.2 Reliability

The research method used and the scope of the study resulted a very narrow data. The data collection was based on a subjective analysis. Because of these reasons it is very obvious that the results can only be seen as indicative.

The aim of the presented model is only to provide some high level guidance and not to state that some method would be the best selection for any specific case. Taking these issues into account it can be stated that the model is a reliable starting point for more specific analysis.

6.3 Issues for further research

The amount of available literature on computer-mediated or mobile communities is very limited. However, there is information available about communities in general and influences of electronic services. Therefore it is certain that there will be activities also in the field of computer-mediated communities, especially in the form of validating different findings about communities also to the computer-mediated and mobile communities.

It would be interesting to explore whether there are major differences between computer-mediated and mobile communities. Does the new terminal offer anything new from the community point of view? How do the communities affect the usage of mobile terminals?

Testing the method developed in this study in field studies could further develop it. Especially the economic cost could be better evaluated using real-life data from various campaigns. Having more information about the costs would enable the development of an efficiency metrics for the methods, which could be used for further developing the model.

[9] Kotler (1997) pp. 92-94

7 References

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8 Appendix A: Interview outline

1. What needs to be taken into account while promoting a new community?
2. What methods are used for promotion?
3. What are the most important methods from these?
4. Which are the pros and cons of each of the methods?
5. Which new features should be analysed?
6. What kind of risks do you think these methods involve?
7. Which risks have the largest effect?

9 Appendix B: Results of the analysis

		Definability of target group	Reach of target group	Economic cost	Repeatability	Complexity	Sociality	Morality	Content of the message	Control over the message
Television or radio advertising		2	3	3	3	3	0	2	2	3
Newspaper or magazine advertising		2	2	2	3	2	0	2	3	3
World Wide Web advertising		3	3	2	3	2	0	2	2	3
Free goods		1	1	3	2	1	1	1	0	3
Multi-channel marketing		2	3	3	3	3	0	2	3	3
Traditional advertising methods	**avg.**	**2**	**2.4**	**2.6**	**2.8**	**2.2**	**0.2**	**1.8**	**2**	**3**
Attraction service		0	3	1	3	2	2	2	1	2
Send link -feature		3	1	1	3	2	2	2	2	2
Chat services		3	2	2	1	2	2	1	2	2
Network visibility		2	2	1	1	2	0	2	2	1
Free services		0	1	2	2	2	2	2	1	0
Methods utilizing electronic services	**avg.**	**1.6**	**1.8**	**1.4**	**2.0**	**2.0**	**1.6**	**1.8**	**1.6**	**1.4**
Exclusivity		3	2	0	3	0	2	2	1	1
Word of mouth		1	3	0	1	2	3	3	2	0
Membership benefits		N/A	N/A	3	2	1	1	2	N/A	N/A
Network marketing		2	3	2	2	3	3	1	2	2
Public visibility		0	2	1	1	3	0	2	1	1
Methods traditionally used in promoting communities	**avg.**	**1.5**	**2.5**	**1.2**	**1.8**	**1.8**	**1.8**	**2.0**	**1.5**	**1.0**
Cooperation with associations		3	3	2	1	3	2	2	2	2
Cooperation with companies (customers)		2	3	2	1	3	1	2	3	2
Cooperation with companies (employees)		1	1	1	2	2	1	2	3	2
Cooperation based methods	**avg.**	**2.0**	**2.3**	**1.7**	**1.3**	**2.7**	**1.3**	**2.0**	**2.7**	**2.0**
Exhibitions		3	2	2	1	2	2	2	3	3
Public events		1	1	3	1	2	2	2	2	3
Targeted events		3	2	1	1	2	2	2	3	3
Event based methods	**avg.**	**2.3**	**1.7**	**2.0**	**1.0**	**2.0**	**2.0**	**2.0**	**2.7**	**3.0**

Impact of Mobility on Instant Messaging Communities

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Abstract

This paper is about mobile instant messaging (MIM). We discuss how it differs from traditional instant messaging and its impact on instant messaging communities from various aspects, e.g. size and location. In addition we try to analyze its commercial impacts on mobile operators and potential purposes. As a base of our work we have selected numerous scientific articles as well as publications from companies in this industry branch. Our most important finding is that there is definitely a future for MIM, but that it is unlikely to replace the current IM communities.

1 Introduction

Instant messaging is a very popular communication method. The concept has been around for a long time. Its predecessors, Unix programs like talk and write, are about twenty years old. Nowadays it is popular also in non-professional circles. The concept has stayed the same for all the time; people are recognized by username and machine name (i.e. email-address). As modern trends in all communication are towards wireless communication, there have been many attempts to turn instant messaging into a mobile service. In this paper we try to analyze this new phenomena, mobile instant messaging, and concentrate especially on its effects on instant messaging communities.

We start from defining what mobile instant messaging (MIM) is. We do that in two parts, we first try to define instant messaging (IM) and then MIM and discuss difference between IM and MIM. We also define what is meant by community in this paper.

Later in this paper we try to analyze commercial impacts of mobile instant messaging as well as its impact on instant messaging communities from a variety of aspects.

1.1 Definition of instant messaging

There are a lot of definitions for instant messaging (IM). According to Microsoft instant messaging is a service that (a) alerts users when friends or colleagues are online, (b) allows users to communicate real time. In addition Microsoft defines that (c) instant messaging is based on a list of friends the user wants to contact [1]. Some sources define that the user is notified immediately of an incoming message with a popup, e.g. [2]. Most definitions also state that instant messaging is a service in the Internet. The first thing listed by Microsoft can be defined as "awareness of presence". A more accurate definition of presence can be found in RFC 2778 [3].

One should not confuse instant messaging with e-mail or chat. E-mail does not fulfil the requirement of real-timeness. In instant messaging one can see if another person is online and thus immediately reachable. In technical terms e-mail is "pull", recipient have to check for new messages, while instant messaging, as well as chat, is "push" technology. In push-technology the recipient receives messages automatically. Another, but a little fuzzy difference is that e-mail provides letter-type of messages (longer) and instant messages are one-line messages (shorter) [4].

Instant messaging and chat are harder to distinguish. Some people see instant messaging as a special type of chat, which is true in certain sense (e.g. real-timeness), but there are some features that are not common in normal chat programs (e.g. IRC). Chats are based on channels, but instant messaging is based on list of friends. This is a greater difference than it may seem. In chat channels one often meets strangers, but because one needs to know recipients address before contact, one seldom meets new people via instant messaging. Hence many glossaries define instant messaging as combination of e-mail and chat.

1.2 Definition of mobile instant messaging

Of course, mobile instant messaging (MIM) makes you more independent of time and place than traditional instant messaging. The concept of mobile instant messaging is a lot older than the term. In a way short message service (SMS) of GSM cellular networks is a predecessor of mobile instant messaging.

There are two reasons why SMS is not mobile instant messaging according to us. Firstly in SMS the user is authenticated by the mobile terminal (or more specifically subscriber identity module, SIM). Thus the SMS is not terminal or device independent. Secondly the SMS does not have the "awareness of presence" feature.

In addition, charging in SMS is per-message based. In order to be widely used, mobile instant messaging should be cheap. Hence, we would like to concentrate on flat-rate solutions, but unfortunately most currently available MIM solutions are based on SMS and charging is message based. Thus we can not include the requirement of flat-rate charging into our view of MIM.

At the moment there is a mobile version of Microsoft messenger that uses SMS messages for transferring messages, but receiving certain types of messages and answering a message costs 10-30 cent each. There won't be coming any revolution with those prices, so we concentrate on flat-rate solutions. Different approaches to MIM are further discussed in the chapter about Different strategic approaches.

As conclusion of this section we define mobile instant messaging as a messaging system with following characteristics:

- awareness of presence
- ability to send short messages to known recipients
- real-time or almost real-time (delay less than half minute) system
- user identification is device and connection independent
- mobile terminals, cordless connection to system

1.3 Definition of community

There is a lot of different communities, they are various in sizes and activity etc. Even a group of nations may form a community. The United Nations may be considered a community having a common interest of world peace. In this paper, however, we consider communities to be formed by individuals. We found examples of different size communities using instant messaging. Smallest ones may be a close circle of friends, perhaps 4-10 persons. At the other end there are big companies or schools, having thousands of employees/students. However, we noticed the possibilities and threats of mobility to be very similar to all regardless of size. We have given thought to size-altering effect of mobility later and despite only a few large-community examples all conclusions and thoughts are valid to all sizes of communities.

An individual may also belong to multiple communities and in this paper we do not study the special features of different kinds of communities but rather the general effect of mobility. Communities may share friendship, employer, hobby, family connection (family is usually not considered as a community, but they might use instant messaging in same way, especially if family members are geographically dispersed). In this sense all communities using an instant messaging application for communication are the same.

2 Commercial impact

In this section we concentrate on the commercial impacts of MIM from four different aspects. First we think of different strategic approaches to making business from MIM. Then we discuss different possible applications for MIM and their customers. Then we analyze the impact of MIM to current mobile operators and their responses. Finally we take a brief look at the differences between Europe and the US.

2.1 Different strategic approaches

In this section we will be looking at a few of the different MIM offerings that are or have been available on the market and try to see how they distinguish themselves from each other. Hopefully we will also already see some tendencies as to which kind of approach might be emerging as the winning alternative, if any of them.

It seems natural to begin with one of the first global MIM service offered. The first operator to introduce a MIM service across Europe was Genie, which is the mobile internet business side of mm02 (formerly BT Cellular). During the Comdex Fall event in 2001 they made public their intention to bring instant messaging to mobile devices using a solution provided by Openwave Systems. When first launched the service was only compatible with MSN Messenger, which was mostly due to the fact that the people behind Openwave Systems are partly the same that developed MSN Messenger for Microsoft. The service

was intended to run over WAP and thus being charged for on a time-basis, which most mobile operators use for WAP services. The main problem with this was that WAP technology had some severe drawbacks. You sometimes had to wait up to 2 minutes to establish a connection and sending messages could be quite slow, which of course does not attract too many customers when you have a time-based charging policy. The service was expected not to reach popularity until WAP over GPRS became available so you could pay based on how much you transfer instead of how long you are connected. The service itself was not branded by Openwave Systems, so Genie could freely develop their own brands around the service. [5]

One year later, in July 2002, the development had gone in the direction predicted at Comdex Fall. Openwave announced that they would be providing Telesp Celular, the biggest wireless Internet carries in South America, with a MIM solution that would work on both 2G and 2,5G networks. With over a fifth of the Telesp's customers using wireless Internet and messaging providing about 1/3 of their WAP revenues, this seemed to be a natural step to take for Openwave Systems. [6]

A brief overlook of the available offerings would be quite incomplete if we were to leave out the four big players on the fixed IM market. Microsoft with their MSN Messenger has chosen quite a different approach than Openwave Systems, as they are going for a pure SMS-based messaging service, at least for the moment. Their pricing structure varies with the local operator so that in Finland you pay about twice as much for messages you receive in comparison to message you send yourself while in the UK you pay the same for messages sent and received. Messages received from other MSN users are however free of charge [7]. There is also some kind of implementation of MSN Messenger for smart phones, but its availability again depends on the local operators.

AIM (AOL Instant Messenger) have taken a much more flexible and mature approach to MIM. They offer the same SMS supported MIM services that Microsoft offers but in addition to this you can also use WAP or even buy a phone with pre-installed AIM support. AIM is free of charge, but you still of course have to pay the normal fees that your mobile operator charges for SMS messages and WAP services [8].

The third of the big fixed-IM operators is Yahoo! Messenger and their offering is quite similar to that of MSN. You use SMS messages to receive and send messages and you pay the standard SMS charge of you operator for the messages you send yourself, while receiving messages is free of charge [9].

The final of the big four is ICQ, which is also providing an SMS-based MIM service. In addition to this, if your mobile operator is O2 in either Germany or the UK you can get ICQ for a phone supporting J2METM and thereby use GPRS for messaging with only an additional daily logon free of 75 pence. The same charge applies if you use AIM instead. If you own a certain PDA phone model from e.g. Nokia, Siemens, Sony Ericsson or Siemens which is running Symbian as operation system, you can also buy ICQ for about 15 dollars [10].

Since this market area can be considered uncharted territory for all players involved, it is far from certain that the first ones to offer this kind of services will be the winners or that the fixed IM operators will be able to use their own installed base in the fixed market to establish themselves in the mobile world. Therefore we will also take a closer look at some of the new companies that are providing MIM solutions at the moment and see what approach they have chosen and how they have succeeded so far.

Black Octopus is a company based in Hong Kong that has had some success in the Asian markets. They have a solution called mParty, which is a mobile community product containing a number of services of which MIM is one. The community already has over 100,000 subscribers and is available to about 30 million users, including a branch of Chinas biggest mobile operator CMCC. Their "pure mobile" MIM solution Open Circuits is different from most of the solutions offered in the western markets, since it does not require any computer access and can be used with any GSM phone. Considering China is the biggest market for mobile applications in the world while still having quite low PC penetration rates, this seems to be a clever strategy. The basic solution is an SMS-based service but WAP and WAP over GPRS can also be used and there is even a desktop version of the software. In addition to this the solution does not require heavy investments upfront, the lack of which is bound to attract customers. [11]

The Israeli company Messagevine, whose main customer is T-Mobile, has focused on compatibility through their Messagevine IM Server, which supports 10 different types of clients. In addition to standard solutions like SMS, WAP and PC they also include i-Mode, BREW, Voice XML, MMS and Wireless Village. The IM solution itself being a private-label product allows the customers to brand the service in any way they desire. They have also developed a product called Messagevine IM Interlink Server, a gateway between the mobile clients and any existing IM community, which is meant to increase the adoption rate of the mobile IM services. Their solutions most certainly have potential but so far the company has not attracted more than a handful of customers. [12]

Followap Telecommunications is the leading MIM provider in Europe, mostly due to the fact that Vodafone, the world's largest mobile operator with networks in many countries, has chosen Followap's solution for their MIM services. Followap's strategy has been to combine their MIM solution with their other area of expertise, the presence services, while at the same time offering much of the same functionality as their main competitors (e.g. a IM gateway to existing IM communities) [13]. This offering is more complete than that of most competitors, but it does require more investments up front. On the other hand it generates a quite powerful lock-in effect once they get their customers on board, since replacing all of Followap's solutions would be time-consuming and expensive. The company is likely to remain a player in the market thanks to their association with Vodafone, but so far they have not been very successful in attracting other customers.

Norwegian Colibria displays yet another approach to MIM. In their solution, the Colibria IMPS Server, MIM is nothing but one service of many. It is not as flexible as the competitors' solutions in the sense that e.g. access to other IM communities and support for other devices than smart phones is merely extra options that can be purchased by the customer. The company's main products are their community tools and presence services, and as such they may not be a candidate for the role of winner in the battle between the MIM providers. Their main foothold is in the Nordic markets and they have yet to secure a major operator as their customer. [14]

In addition to the companies discussed above, there are a lot of different solutions available. Especially for smart phones there is free MIM software, many of which are based on an XML technology called Jabber, available for anyone to download right of the Internet. While these applications does not play a major role on the MIM market today, that situation may change as more and more people are buying smart phones. Companies like Tipic [15] and Agile Mobile [16] may yet prove to be the biggest threat to the mobile operators' goals of increased messaging revenues, at the same time eliminating the business ideas of the less specialized MIM providers.

To summarize this section you could say that AOL is providing the perhaps best service offerings of the four fixed IM operators through its products AIM and ICQ, while Yahoo! and MSN are still relying on SMS messaging. The future is most likely in GPRS-based instant messaging, simply because of the cost-advantages to the customer. With that in mind it seems like AOL might be getting the upper hand on the MIM market if Yahoo and Microsoft don't update their offerings soon. When it comes to the newly-established MIM providing companies, there is not yet any indication of who the winner might be. The main players have all chosen a bit different approaches and at the same time market segments that are not completely over-lapping. It might very well be that the winner will not be determined by the superiority of any one solution, but the success of their main customers.

2.2 Potential applications

Technology is nothing without content. Thus we hope to find some potential applications for MIM. In order get popular, MIM has to have some kind of killer-application. In this section we consider possible ways of using MIM. As we think of new applications, we assume that using MIM is cheaper than using SMS or at least not more expensive.

First let us first examine what current instant messaging systems are used for. Especially teens use instant messaging for communicating with friends. A study of 15 to 20 year old IM users showed that a typical teen user spends 2-4 hours a day and has 3-5 friends she talks with in one session. The study claimed that almost all their IM friends were friends in real life, as we argued in chapter 1.1. The study also suggested that the primary use for IM was socializing, everyday chitchat. Another main use was planning social events, e.g. shopping and going to movies. IM was also used for schoolwork collaboration, mainly between friends, but even some teachers were experimenting use of instant messaging receptions [17]. Another research report shows that students in a Swedish university used instant messaging system provided by school mainly for four purposes. Firstly, to find out what are other people doing. Secondly, they used it to coordinate social activities, such as meetings etc. Thirdly it was used for finding out the location of people and fourthly for sending greetings and chitchat [18]. Instant messaging is also used in workplace communication. Albeit some people avoid using IM in work, many have found it to be very helpful tool. A study shows that the central use of IM in workplaces was quick questions and clarifications. It was also used for coordination and scheduling and keeping in touch with family and friends while working [19].

These studies have been about traditional instant messaging, but it is very probable that similar trends continue at Mobile world. The effect of "always-online" might be something similar to the difference between those teens with dedicated lines vs. teens with modem connection. The use of messenger was not much bigger, but more scattered during the day. Another distinction was presence information. When

people were always online, there was no way of knowing if they really were there [18]. The effect of mobility, on the other hand, undoubtedly raises the number of "where are you?" and "I am in X"-types of messages. There also might be automatic ways of finding out the physical location of people.

The first and most obvious application for MIM is leisure time chatting. As those studies showed, the main use of instant messaging is currently chatting. This is the most probable killer application of MIM, especially if it is cheaper to use MIM than SMS. Mobility and always online give lot of opportunities for different leisure time applications. Locating other people might be a hit. Instant dating may be the first thing come in mind, but finding new company to other occasions, such as watching or playing sports games could also be interesting idea.

As mentioned earlier, MIM could also be used for educational purposes. More systematic approaches for using IM or MIM in education can also be found than the previously mentioned case of teachers holding IM receptions. Some universities, such as the University of Twente in the Netherlands and the University of Kassel in Germany have mobile services for students and personnel. Their portals, namely "M-Poort" and "Campus-mobil®" use GSM, WAP and SMS for communicating [20]. If there was a MIM solutions available, it might fill their needs better than old SMS messaging.

The ease of event coordination and location solving is attractive to many employers, especially those who have employees in various locations, many of them mobile. Let us imagine a situation where a company call-center receives a call from customer desperately needing help. With an advanced tool the customer servant could easily see if any suitable maintenance men were near customer. Then she could send MIM message (or call) to the nearest ones and ask if they were able to help the customer quickly and if yes, she could give instructions in a MIM message.

Many services currently using SMS could be transferred to MIM-services. Many libraries, for instance HUT main library [21], have SMS services that tells people when their loans are about to expire. Such services are free except the fee of the SMS messages by the telecom operator. Converting this service into a MIM-based would save money for both the library and the customers.

The main problem in mobile instant messaging services is incompatibility of current IM and MIM solutions. Some (non-mobile as well as mobile) messengers can handle messages from all conventional messengers, e.g. those based on Jabber [22]. Also another common protocol for MIM has been developed. The Wireless Village-protocol suite has been developed by SonyEricsson, Motorola and Nokia [23]. Despite this, compatibility problems still remain between traditional instant messaging and mobile instant messaging. Most people probably would like to access same IM network with mobile and non-mobile terminals.

Another possible problem is instant messaging spam, nick-named spim. Ads or pure spam is seldom sent via SMS, because someone's has to pay for every message. Paying for every message is totally contradictory of our vision of future MIM. Hence spim could become a real problem. Lack of an (extra) charging mechanism creates also other problems. Payable services are hard to develop to MIM and therefore payable services are hard to transfer from SMS to MIM.

2.3 Impact on mobile operators

One of the biggest revenue sources for the mobile operators has during the last years been SMS messaging. With this in mind the operators have also been making an effort to expand their messaging services through the introduction of MMS messaging, which would hopefully be the next killer application which would both encourage customers to switch to 3G networks as well as getting them to pay an even higher premium for the messages. Thus it is no surprise that the mobile operators have fearfully watched the inevitable introduction of instant messaging service as a mobile service. Especially the threat from the four biggest brands fixed-IM brands (AOL Instant Messenger, MSN Messenger, Yahoo! Messenger and ICQ) was something that had to be address at some time, rather sooner than later.[24] This means that a starting few years ago we have had a situation where the mobile operators have to choose between introducing services that might very well reduce their over-all incomes from messaging or try to compete with the new instant messaging services because if the operators wouldn't provide these services, someone else surely would[25].

For fixed-IM operators, going mobile is a very interesting option, since it might give them an opportunity to charge customers for services that in the fixed networks are free of charge. In addition the market space is interesting for companies without a presence in fixed-IM as well. One of the first companies to offer this service was Fastxt (currently Fastchat), which offered a GPRS-based messaging client for Symbian with a monthly charge of $5.99 in the US (500 free messages included). On average the customers sent 247 IM

messages during the four first days, but only one SMS message [24]. A quick look at where Fastchat (previously Fastxt) is today reveals that they have added instant voice messaging (push-to-talk), picture and video messaging and email to their service. The price for a one-month subscription is currently $2.99 which includes an unlimited amount of free incoming messages [25].

In response to this threat most operators chose independent white-label companies as providers for their IM services in order to maintain control and an event-based approach to billing [24]. T-Mobile chose Messagevine, Orange Antepo and Vodafone Followap, just to name a few examples. Interoperability with the fixed-IM clients did however turn out to be a problem, since the fixed-IM operators were unwilling to agree to interoperability. Some kind of revenue sharing might be needed to make such deals possible, but no information about such deals could be obtained for this study.

Another significant problem with MIM (Mobile Instant Messaging) is that it is so hard to find a suitable business model for it. The customers are accustomed to using IM free of charge online, so how to convince them to pay for using it in the mobile devices is a serious challenge. Fastchat is charging about 2-3 cents for every message you send from you mobile device while not charging at all for incoming messages [26]. With SMS prices at about 10 cents in the US [27], this is clearly cheaper than traditional messaging, but still far from free. Using MSN Messenger is even more expensive. You pay 25 cents for each message you receive and 10 cents for each message you send yourself if Radiolinja is your service provider [7].

A closer look at these two ways of billing gives us an idea of the problem. With Fastchat there is potentially a lot of traffic moving through the network which the company can never bill anyone for if it comes from the fixed network. On the other hand, if the prices are as high as with MSN, users are unlikely to be willing or even able to pay for the service provided. For some services the amount of messages originating from mobile devices have been about half of the amount messages transmitted to mobile devices, leaving the operator with the problem of financing the total sum of messages while only being able to charge for a third of them. European operators have been trying to implement MIM on top of SMS, as a kind of value-added service. This would allow them to keep their SMS revenues, as long as the customers are willing to pay that much for IM services. How they are going to prevent independent service developers from bringing GPRS-based solutions to the market is however still unclear. Products like Skype, which is aimed to provide free mobile communication between WiFi hotspots and instant messaging over GPRS might become a serious threat to the revenue streams of the mobile operators [28].

2.4 Regional differences

In this section we discuss regional differences between Europe and the US. First we try to find some substantial differences and then we analyze how they might impact on MIM usage development.

There is a noteworthy difference in the number of internet users in different areas as shown in Figure 1. United States have a lot more Internet users than in Europe if we measure per capita. Hence, instant messaging is presumably more common in the US than in Europe. From these figures one might suppose that Americans might be more familiar with MIM concept. The fact that PDA's are more common in the US than in Europe also supports this assumption. We must notice here that Figure 1 is based on year 2002, as well as Figure 2. However, both figures show such clear trends, that the situation is probably still somewhat the same.

However there is one, pretty surprising, counter-argument presented in Figure 2. The number of mobile phones is tremendously larger in Europe than in the US, almost double. This turns the situation upside-down. Through SMS, Europeans are very familiar with the concept of MIM. In the US the most popular cellular network, CDMA, does not have any feature similar to SMS. Also, mobile phones are a more suitable base for MIM than handheld computers, because most handhelds lack the essential communication features standard in mobile phones. Hence, we think that there are better chances for MIM to succeed quickly in Europe than in the US. For same reasons, it is also presumable that negative impacts to the mobile operators, discussed in previous chapter, are more powerful in Europe than in the US.

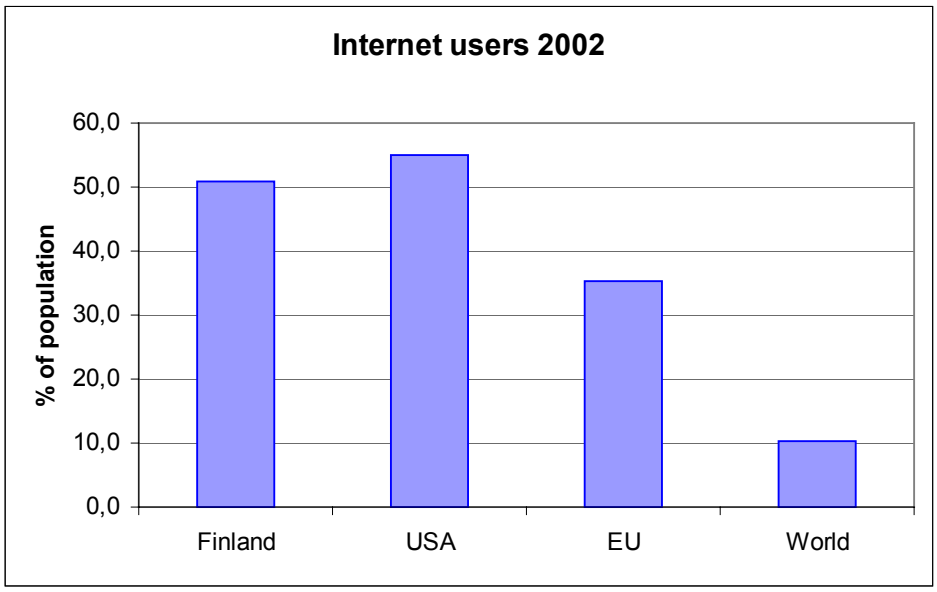

Figure 1, Internet users in year 2002 [29]

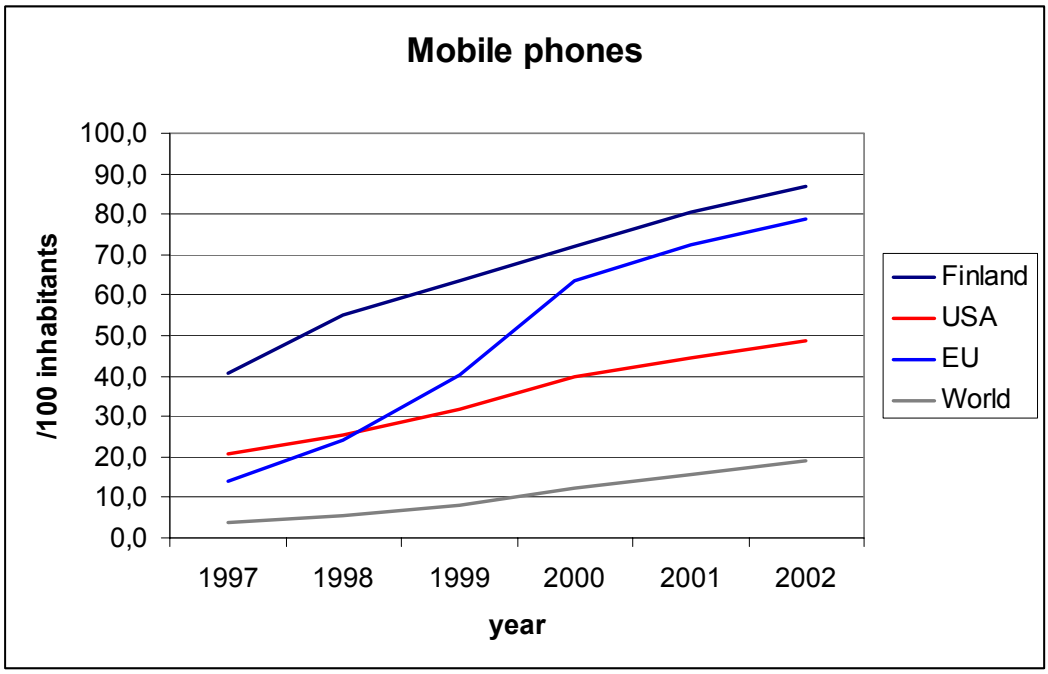

Figure 2, Mobile phone penetration in world [29]

3 Impact on communities

In this section we analyze the effects of MIM to instant messaging communities. First we consider the possible impact on community size. Secondly we think about whether the borders of communities are moving and to where. Thirdly we analyze if the whole community might be shifting location into the mobile world. Finally we discuss possible behavioural changes inside communities as (more) mobile features become available.

3.1 Increasing the size of communities

In this section we try to analyze the effects of mobility to community sizes. First we discuss if mobility brings more instant messaging users. A growing number of MIM users do not guarantee a growth of the actual communities. Hence we also thought about reasons why the number of users should and should not affect community size.

New users for instant messaging communities come in two ways. The first way is that an owner of a suitable terminal device wishes to use her terminal for instant messaging. Another way is that a person is so eager to have instant messaging, that she buys a terminal, probably capable for a lot of other functions, in order to have IM/MIM. The latter is highly unlikely, at least at the moment. As MIM grows popular, that may become a trend or, more likely, people require MIM features from handhelds and cellular phones they are buying. Here we concentrate on the preceding option.

As we can see from Figure 1 and Figure 2, in the US there are much more Internet users than mobile phone owners. There are, of course, people who do not have an Internet connection, but have a cellular phone but they are just a small minority. In such markets instant messaging systems may get only a few more customers through MIM. In Europe the situation is very different. Only a third of population is using the Internet but 90% of population have mobile phones (thus, if somebody has several, the actual percentage may be smaller). In such a situation introduction of MIM more than doubles the number of potential instant messaging users.

The question remains whether the potential users become users of instant messaging and expand the already existing communities. As we recall from the introduction, instant messaging communities are mostly based on people knowing each other beforehand. The study discussed in chapter 2.2 also showed that teens using instant messaging complained about the inconvenience and additional work required to contact friends not using IM. Some even said that maintaining relationships with such persons was more difficult than those using IM [17]. As many people have adopted instant messaging, the pressure to start using MIM/IM comes from friends. Thus we assume that many of IM communities expand as friends and colleagues of IM users start using IM.

On the other hand if IM becomes easily available to more and more people, it is obvious that also other persons than friends of IM users start using IM. Circles of friends are, however, quite limited in size and all friends or colleagues of a person are seldom familiar with each other. These facts support the argument that community expansion is quite limited and that new communities will arise.

3.2 Expanding the borders of communities

Here we intend to discuss the issue of whether old communities, especially those online, might expand into the mobile realm. It is this development that the fixed IM operators are hoping for, while many mobile operators would gladly provide solutions that are not based on existing communities (at least if they would have to share their revenues with the fixed IM operators).

The first issue is the question of cross-network access vs. closed communities [30]. Cross-network access does make the MIM solution more attractive to the customers, especially since most fixed IM solutions have not provided such a feature online. A downside of this might be that the community looses its uniqueness. If one looks at it from the perspective of economics, it's a question of deciding whether you want to try to "steal" some of the benefits the consumers get from the network externalities gained by drastically expanding the amount of users or avoid standardization in order to be able to differentiate your product and thus charge a higher price.

Theoretically companies prefer compatibility when standard competition is intense, while they prefer incompatibility when product market competition is intense. In our case, it is the product market competition that is intense, and that would indicate that at least the fixed IM operators are not too keen on cross-network access. Unfortunately for them, there are already products like Agile Messenger available free of charge that provides cross-network access. CEO Risto Savolainen from Taika, however, says that: "Once consumers have found others who share the same interests, issues, concerns or passions they are less likely to switch to another service provider. This means increased customer loyalty and decreased churn." ARPU for mobile community services are at the moment in the area or 5-10 euros per month, and are expected to grow as the technology evolves, which would indicate that operators will be very interested in any approaches that help them keep these customers. [30]

A second aspect comes through the fact that MIM would be able to provide presence and location information as well. Users would be able to determine where their friends are and what their status is (e.g.

in a meeting, busy, online). This could on the other hand create some problems as well, especially with the privacy issues. Users would have to be able to completely and easily maintain control of who has the right to access that information [31].

We also need to consider the financial aspects of the IM market and to what degree that might influence the development in this area. As mentioned earlier, the operators on the fixed IM market are not at the moment charging anything for the use of IM communities. Having a hugely popular service without getting any revenue from it is of course not in the interest of the operators and they have therefore been looking at different alternatives to create revenue streams from the communities. During the later part of the nineties several attempts were made to start virtual communities that you could earn money from, but few succeeded in generating enough revenue to cover their expenses. With mobile services it is generally believed that customers are more willing to pay, although there are no empirical data to confirm such a notion yet.

You cannot build a community, communities build themselves. The user of the community is also in the widest sense the owner of the community. Still, you can provide services for a community and also try to make it more attractive for both old and new members. As we will see in the next section, mobile communities are likely to consist of small groups of friends. This does not, however, prevent you from generating revenue. What a fixed IM operator must remember is that using an online community and a mobile community is two totally different experiences. Online you have a full-size keyboard and 17-19" screen, while a mobile user is using a device many times smaller. This means much higher demands on usability. [31]

Overall, this means that there are a lot of open questions still before we can say for sure that the fixed IM communities will or will not expand into the mobile market as well. Even though questions like compatibility, handling of user information and the limitations of the mobile devices compared to computers all are important, the verdict will not be based on these. It is instead the willingness of users to pay for using a mobile community that will be decisive. Of the three alternative pricing strategies (subscription-based, traffic volume-based and combinations of these two), it is hard to find a superior one. Subscription-based pricing is easy to understand and simple to bill, but puts a maximum limit on revenues. Traffic volume-based would require that prices lie below regular SMS prices in order to be a competitive alternative and it might make it necessary to provide presence information for free since paying to see who is online might deter customers. At the moment, the recommendation in the industry seems to be volume-based billing, especially since operators are still trying to reach the critical mass for their MIM applications. In addition, almost all MIM solutions are currently targeted at the youth market, where the users have limited funds to spend on their mobile devices. We believe that once the operators have found some working business models for MIM, solutions for business usage will be emerging as well. [31]

3.3 Shifting the location of communities

In this section we will be concentration on whether the location of communities might be shifting from the Internet to the mobile devices or if the development is expected to lead to peaceful co-existence between the two forums.

The first thing we need to do is establish how mobile communities might be different from web-based virtual communities. According to Tasch and Fremuth [32] there are three different ways in which mobile communities differentiate themselves:

- Mobile communities can be accessed by mobile devices like mobile phones, smart phones and PDA's
- They offer new communication services, made possible by the use of mobile networks
- Mobile communities will show different usage patterns in comparison to existing virtual communities

The first way is self-explanatory. On the second, certain characteristics can be given that separates a mobile service from online services. These are ubiquitous access, instant execution, personal trusted devices and location related services. Ubiquitous access means that you can access your services anywhere, not just at your computer at home or at work. With instant execution, you don't have to turn on some software or your computer in order to be able to communicate; you are always able to communicate. The personal trusted devices eliminate the problems of false identities and misuse of data that has been a problem in online communities. You can be identified based on your phone number or SIM-card. This does not

necessarily mean that you would have to give up your anonymity, just that no-one else can steal or misuse you community identity. Location based services can be used to find community members in real life etc.

The most interesting aspect for this paper is however the possibility of different usage patterns. Tasch and Fremuth [32] suggest that although no empirical data is available on the subject, there are some indications that mobile communities are more often centered around the single users and not around topics or interests. Mobile services are mostly used to stay in touch with close friends and family. A study by Joachim Höflich [33] showed that German teenagers considered the mobile phone to be a very personal device, enabling them to have private communications even in public places. This could mean that mobile communities might be smaller than online communities, since the circle of close friends is rather small in comparison to the amount of people with the same interests. In our case the implications could be that while IM is still likely to be successful for mobile devices, chat services might not be.

We will continue with having a look at what makes virtual communities successful. According to an empirical study by Leimeister, Sidiras and Krcmar [34] both male and female users considered handling of member data, stability of the service, reaction time of the service, assistance for new members by experienced members and established codes of behavior to be the most important factors determining whether a community would be successful or not. A mobile community would have an advantage here since mobile operators are less likely to sell member data to third parties than an online community provider. This is due to the fact that sending advertisement through email is almost free of charge while contacting mobile phone users would be a costly way to advertise (as long as communication is SMS-based at least).

Finally we will also look briefly at a theory about how the development of mobile communities might evolve. The community framework presented by Fremuth and Tasch [32] is the basis for the idea presented by Fränkle, Fremuth and Tasch [35] that mobile communities will develop from being just a service that is used by existing groups of friends to providing communications spaces (e.g. synchronous, asynchronous, one-to-one, one-to-many, many-to-many) and finally we get mobile community platforms that consist of technical solutions and infrastructure that give the users new community services.

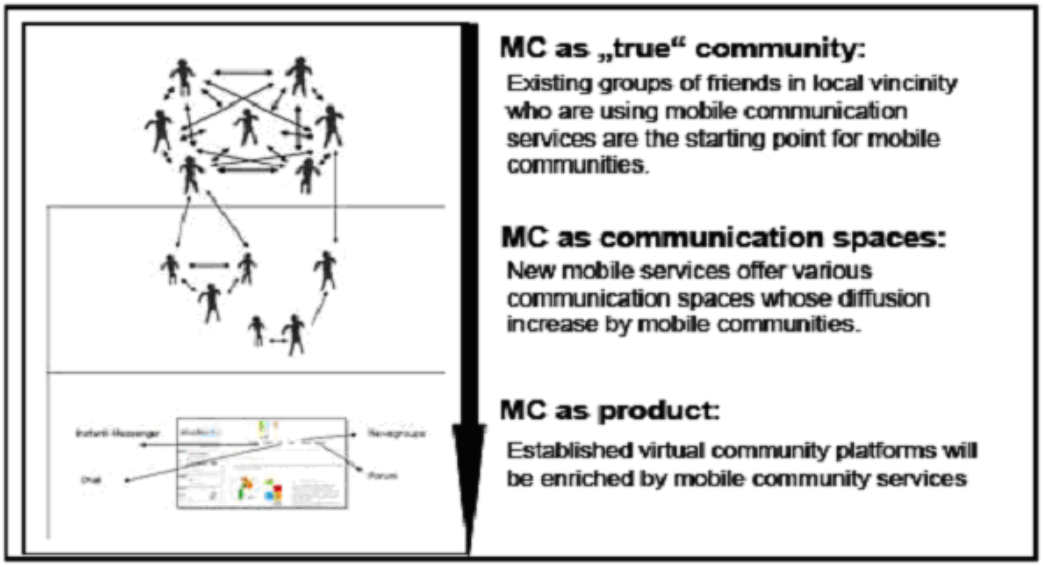

Figure 3, diffusion of mobile communities (MC) [35]

Based on what we have discussed in this section, it is our conclusion that mobile communities have several advantages over online communities and that there probably will be some transfer from the online communities to the mobile side. This does not necessarily mean that the services won't be provided through the same companies that are controlling the market for the fixed IM communities. On the contrary, the two communities are likely to become blended, with customers accessing the community both through mobile and fixed services. It does however suggest that starting from building an elaborate technical platform for mobile community services might not be the best idea. Providing basic MIM functionality to users and later on adding more services could be a better approach from a business perspective.

3.4 Changing the behavior within communities

In this chapter we discuss behavioral changes in existing communities when they move partially or completely into the mobile world. We will not discuss whether the traditional online part will be destroyed or not, that was considered earlier. Rather we discuss the possibilities of mobility and its customer value.

Different manufacturers and operators have huge visions about MIM. Nokia sees (awareness of) presence as the most revolutionary feature of MIM. Nokia extends presence features from their traditional online-offline type binary data. Presence has multiple layers. One can be publicly offline, but online for closest friends. This kind of feature has been available in some instant messaging systems already, but not in this advanced form. Besides only traditional online-offline status, people can also advertise their mood. Their status may contain information such as personal and device status, location or context, terminal capabilities and preferred contact method [36]. From the status friends see if a person should be bothered with something or rather left alone. In fact Nokia sees presence so revolutionary, that they consider it as a whole new system, but we will define it as just a feature of MIM.

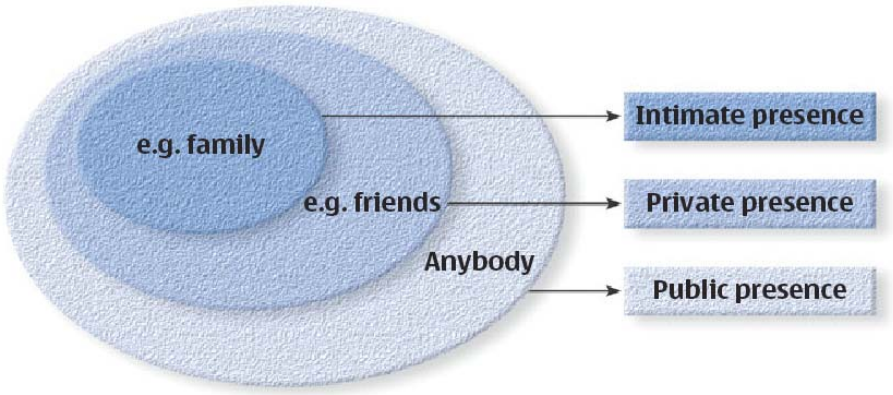

Figure 4, Nokia's vision of presence in MIM [36]

The effect of this enhanced presence is probably more effective communication. It is easier to pick someone to communicate with when you know their moods. It may also cause problems inside communities. Eventually some people find out that some others lie about their presence information. They get annoyed as their messages are rejected while messages from others are accepted. This may create tensions inside communities. Different inner-circles can be formed and the unity of the community may be compromise. On the other hand, enhanced presence ease belonging to multiple communities with the same client as controlling them becomes easier.

A feature more closely linked to mobility is localization. The location is highly demanded information. As mentioned in chapter 2.2 one of the most common messages was "where are you?" Since hardly no-one wishes to share location information with all people all time, a mechanism is needed to restrict the availability of location information. The feature itself is very desirable. When you see where your colleagues and friends are, it is easy to pick closest one if you need some help. As a very useful feature, it too contains some risks to the community. If one does not allow her location information to be available, some people may get annoyed or jealous even though one only wishes to spend some time alone.

Another result of the use of mobile terminals is "always online". When people carry their mobile terminal with them, they are available almost all the time. As discussed in chapter 2.2 the most probable results of this are shattered communication and multitasking. The former means that the communication sessions are not as intense as earlier, because since people are online all the time you may communicate in your own time. The latter means that communicating is not the primary action anymore, you do mainly something else and chat only occasionally. This is a great change compared to people who have to make an Internet connection in order to chat with friends. This may mean that communication inside communities is no longer so active. It is easier to start conversation as somebody comes online; it is harder to start chatting if she is always there. And besides, you cannot even know if she is there. The "always online" feature also enables people to actually chat all the time and everywhere, so also addictions may get worse, but we don't see how this risk could be avoided.

All these new features provide more efficient communication but they also have their downsides. They may all also harm communities, but great negative impacts are unlikely. More precise estimations of effects are hard to make as real studies on the issues are hard to find. MIM has not yet been properly studied, probably mostly due to the fact that there are still no hugely popular MIM communities available.

4 Conclusions

We will now discuss the most important conclusion that we have reached based on the issues discussed in this paper and at the same time summarize our findings. There are not that much hard data available on MIM communities yet, so some of our conclusions will be more like qualified guesses than actual facts.

The most important things to keep in mind when it comes to the business side of mobile communities as a whole, and especially mobile IM communities, is that it finally comes down to a question about cost. How to make people pay for something that they can use for free online and at the same time compete with free open sources solutions will be the key issue to solve for those who intend to generate revenue out of MIM. The operators are likely to get some revenues in any case, since both SMS-based and GPRS-based services can be billed for. The fixed IM operators on the other hand will have to find a way to transfer their strong hold over the online users to the mobile side, if they are to gain any revenues at all.

At the same time there is a need for more than just plain technology, the mobile users will probably want something more in order to start paying for IM services. Services based on location and presence information could here be one way to go, another option would be to replace the current SMS-based services with IM. You also need to consider what market to enter. There is by tradition more messaging going on in the American market but the penetration of mobile phones is higher in e.g. Europe, while the Asian market shows the biggest growth in terms of mobile users.

Concerning the communities, we think that it is more likely that we will see an increase in the amount of communities than an increase in the size of the current communities. The mobile devices are mostly used to keep in touch with a close circle of friends, so communities similar to online chats might be more unlikely killer applications on the mobile side. Here again, the cost of the services will be crucial, especially the billing model. A pay per usage model seems to be the more appropriate solution at the moment, but if fixed fees for data services become more common through the introduction of 3G it might become the dominant solution for MIM as well.

We don't, however think that mobile IM will replace online IM. The two will most likely become blended, with users sometimes accessing the communities through fixed lines, sometimes through mobile devices. This could at the same time be the greatest competitive advantage that the fixed IM operators have. It is unlikely that a pure MIM solution will become dominant on the market, the winners will probably be mobile versions of the current fixed IM communities. With mobile IM being able to provide presence and location information in combination with the ability to be available at all times, the future might be such that the choice between which versions of the community to access will depend on the services that you need at the moment. If regular chatting is all you need, the online, free community will be enough, while at the other hand you are willing to pay for using the mobile community when location or presence information is essential or you don't have access to a computer.

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