Internet gaming community

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Online multiplayer gaming has become quite popular due to the growth in computer networks. Today great many players play online multiplayer games all around the world. A huge amount of these players are involved in multiplayer gaming communities. This study proposes features and enhancements for Paf internet gaming site, to transform it into an online gaming community.

First the current Paf gaming site is presented along with an overview of players experience on the site. The study then elaborates the requirements to form a community and discuss tools like chat, public profile and forums to be a critical part of this community. Later on, a comprehensive, design is presented to integrate these community features into Paf gaming site. Sketches are drawn to convey and elaborate these features. Special focus is given to communication between players in the gaming community. The study presents the main requirements for chat management in Paf gaming community and then presents the most feasible communication tool for the gaming community. At the end a prototype is implemented and a user study is conducted to evaluate the approach from user's perspective.

Keywords: computer games, social networks, virtual communities, Paf, Paf site, gaming operator

Table of Contents

1 Introduction

1.1 Geographical Locations and Communities

In biological terms, a **community** is a group of interacting organisms sharing an environment. The word *community* is derived from the Latin *communitas* (meaning the same), which is in turn derived from *communis*, which means "common, public, shared by all or many [Harper, 2001]".

The perception of a community was changed with the idea of Licklider and Taylor [1968]. They were way ahead of their time and highly optimistic. They suggested “setup of an experimental network of multi-access computers in order to move forward with the development of interactive communities of geographically separated people”. Licklider and Taylor claimed that societies will not be able to cope with the flow of information with the conventional ways of communication, but they will require new ways of creating a shared understanding.

Based on these ideas they describe a shared platform for communication. They further described that “Such systems cannot be developed in small ways on small machines. They require large, multi-access computers, which are necessarily complex” [Licklider and Taylor, 1968]. These concepts were put to test in a project called ARPANET, which eventually became the Internet that we know today.

With the popularization of the modern internet online communities started to emerge. It all did not occur overnight, the initial ground for communities were provided by tools like email client and message board systems. In 1986 Elm was the pioneer in its category as it was the first text based email client for UNIX systems with cursor like screen displays. The name Elm was originated from Electronic email and it was developed by Dave Taylor while working at Hewlett-Packard. The first bulletin board system or BBS was developed by Ward Christensen in 1978. It presented most information with ordinary text and some graphics. BBS became rapidly popular and started two monthly magazines that provided coverage of software and technology innovations and the people behind them. But with the rise of World Wide Web (or simply the web) BBS was quickly forgotten. The development of electronically aided communication has been quite rapid during the end of 20th century and the beginning of 21st century. From the initial steps of text-based computer mediated communication (CMC) in the 1960’s and 1970’s to the multimedia enchanted entertaining experience of the beginning of 21st century, the realities of both free time and work have changed drastically for millions of people around the world. Especially after the dot com period in the late 1990s and early 2000 showed that CMC in general and internet in particular are here to stay.

The communication possibilities that internet opened were not limited to passing simple pieces of text to each other. Since the beginning computer and computer networks were used to play various types of interactive games. One of the very first examples of such a game is Empire, it was a strategy game and it ran on a PLATO mainframe in the early 1970s [Demaria and Wilson, 2002].

There were many other computer games that allowed people to play over a network of computers rather than on a single computer.

During the next decade computer games developed at a rapid speed. Some of the games continued to form into multiplayer games and utilize the possibilities by computer networks. These games allowed a player to play and communicate with each other. It is possible that some of the communication was social in nature and it resulted in the birth of computer games related networks instead of being located on a single workstation.

1.2 Multiplayer Games

Games where several players come from different locations to play together can roughly be defined as multiplayer games. The true joy of gaming comes by playing alongside the boundaries and limits defined by the game rules. And to play with other players under certain rules and restrictions brings the true joy of gaming. Many of the most famous games of our times such as chess and card games have roots that go back to thousands of years ago. Even though there are several games that can be played alone, gaming as a general concept has a communal aspect. In other words multiple players play together and form a community. This stress on community shows that gaming offers an interesting context from a communication context. In most of the cases players are found to be communicating with each other weather it is to access the current situation of the game or to plan the next move against the opponent. This communication can also include motivating other team members to perform better, or consoling them after a lost game.

Online multiplayer games follow this tradition in many ways. They require multiple players to participle in order for the game to function properly. They offer possibilities to communicate that were never there before. For instance, the sheer volume of participants in a multiplayer game could be in hundreds or thousands. Furthermore, multiplayer games make good use of computer networks in a way that they allow many players to come together and play from multiple contents.

The early examples of multiplayer games are space war and Pong [Kirriemuir, 2006]. This was due to the fact that the computing capabilities of computers were quite limited. Although these games were two player games there are also examples like Empire, a strategy based game that could include as many as 32 players. Interestingly, the beginning of online multiplayer games did not show any signs that they will become the dominant type of games in the next few decades.

In the 1970’s and 1980’s, the computing capabilities of personal computers improved to enable computer guided opponents. This caused in a huge growth of single player games. So, between the late seventies and the mid nineties there was a steady growth of games that could be played on a home computer. Throughout the 1990s, developers of computer games followed closely the advances in computer network technology. Games such as Doom in 1993 utilized computer networks as a distribution channel and also allowed a small number of players to play with each other, effectively including a single player game and a multiplayer game in the same package. So,

towards the end of 1990 connection speed increased and so did computing capabilities, hence the era of online gaming truly began.

1.3 Features of Multiplayer Games

There is a great variety of multiplayer games available in the market; some games expand single player games by adding to them the online multiplayer aspect while the others are supposed to be played by multiple players from the start. Some require a handful of players while the others need hundreds of players to function properly. Some just allow the players to drop in and play while the others require players to spend large amount of time to achieve a good gaming experience. But as a concept there are a few things that connect multiplayer games. First a multiplayer game requires two or more players who are not computer controlled. Most multiplayer games follow a pattern of two teams, multiple single players, or multiple teams [Aarseth et al., 2003]. Second being online games it requires that the game has connection to computer networks. Generally this means that the game require an internet connection but not in all cases. In some cases the players might build a network specifically for their gaming purpose, as in the case of LAN, or when company employees use the local intranet to play a game after working hours.

Not all multiplayer games require the kind of social interaction that leads to lasting relationship, groups, or communities. For example, it is possible to join in the net for a quick game of poker without any social interaction or communication. There is communication or interaction for sure, such as when one player makes a move that affects the other player or players can participate in the game. But just because there are multiple players does not guarantee social interaction. Such environment should be provided where the players can expand their gaming experience outside the game, and in doing so, engage in different activities forming an online multiplayer gaming community.

The games most suitable for a gaming community are the ones that require players to interact with one another in order to be able to fully experience the game. So, there is a distinct advantage in forming a stable relationship as they allow the players to reach higher levels of cooperation as when they play with strangers. When the communication between the players is so common it is no surprise that it is also to some extend social in nature. As mentioned, although not all players appreciate the social aspect of multiplayer games, sociability seems to be a major motivational factor for players [Yee, 2001; 2006; Griffiths, et al., 2003]. In some cases, the social factor becomes more important than game playing itself. This is true for more experienced players [Schiano and White, 1998]

1.4 Social Interaction in Multiplayer Games

Players in multiplayer games engage in social interaction both within the game and outside as well. For example, players might meet face to face or interact on telephone or just interact with the possibilities that the multiplayer game offers. This section will discuss the communication possibilities within and around the multiplayer games. Few of the most common options available are communication through text, vocal communication or communication offline.

Practically every multiplayer game includes at least one build in communication system capable of transmitting text messages. A common example of such a communication system is chat or message board. These systems make it possible to 1) send messages to all participants in the game 2) send messages between selected groups 3) send messages to a specific player. Within a certain game or a group of players the first function can be obtained by common message boards or by shouting in the game. This is typically used by administrators and not so often by the players, unless the game has a problem or an issue that the player would like to communicate to all participants. The second is used by groups of players or communities who want to send the messages to multiple players but want to select the specific players the message goes to. The third function, person to person, is typically an instant message system or an email.

Many multiplayer games provide the possibilities of vocal communication; in addition, there are multiple stand alone programs that can be made to run in the background of the game for the same purpose. The reason for using vocal communication over text based could be different for different players. Sometimes the players think that text based communication is too slow or the player could have a constraint from the game that he/she cannot keep both hands on the keyboard. Vocal communication is strongly adapted in certain gaming cultures. It seems that vocal communication is typically more popular where the games have a fast tempo and/or require extensive communication between the players. Despite of these factors communication with text is the most popular method of communication.

Apart from text and vocal communication most multiplayer games provide players with some sort of avatar. An avatar is a virtual representation of a player in the game world. Taylor [2003] proposes that the purpose of the design is to give players many handles, as many ways to be expressive. Avatars enable players to express themselves as virtual realties in the game world. They come in many shapes and sizes and represent different personalities.

1.5 Virtual Community

It was not until the early 1990s that the academic worlds started to have interest in community like social organizations [Strait, 1994; NTIA, 1994]. Morino Institute [Morino, 1994] summarizes the Emergence and Evolution of Community Networking as shown in Table 1.

1970	ARPANET created
1974	community memory created
1978	First BBS
1980	Old Colorade city – first community oriented bbs
1984	ST. Silicon's Hospital medical BBS
1986	Clevelend free net
1989	Big Sky Telegraph
1991	Santa Monica pen
1992	Internet society, ccn founded
1992	world wide web created
1993	Mosaic released
1993	NII: Agenda for action published
1994	CPB, NTIA awards announced

Table 1: Summary of the Evolution of Community Networking

While there were several terms used to describe this phenomenon, it was the term virtual community that became most popular in academics and popular media. This term became general with the help of the book "The virtual community: Homesteading on the Electronic Frontier". From that book the most famous definition for the term virtual community came, Rheingold [1993] describes them as, "*social aggregations that emerge from the NET when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationship in cyberspace*".

From a very different perspective, Nicholas J. Gervassis from the University of Edinburgh Law School writes about two types of virtual communities. "The first community, the intellectual virtual community, can be characterized on the basis of a shared (intellectual) interest, for example, members of a political organization, or a Lords of the Rings fan club. The second, the functional virtual community, can be defined as a group of users participating on a single application platform, for example, an online game such as Ultima Online [Ultima, 2010]. To understand the difference as well as the potential for operational conflict between the two, one might draw upon the contrast between nations and states. Where states constitute regionally limited legal formations, nations are broader in their geographical manifestations and are decided upon shared cultural characteristics that distinguish ethnical groups. Functional communities resemble states: pinpointing their online locus at specific IP addresses, they submit to fundamental operational rules, set in the launching software's computer code. Similarly, intellectual communities resemble nations. Although group members rely upon a functional community as a means of gaining network access (citizenship), they adhere to collective basic characteristics, tastes and intellectual qualities that define their shared bond beyond the procedural mechanisms of limited online geographies (nationality)" [Gervassis, 2004].

Barry Wellman [2005] wrote "I define "community" as networks of interpersonal ties that provide sociability, support, information, a sense of belonging, and social identity. I do not limit my thinking about community to neighborhoods and villages. This is good advice for any epoch and especially pertinent for the twenty-first century." Wellman [1997] has also talked more about networks than groups online which is another important angle into the definition of online community. "We find community in networks, not groups. Although people often view the world in terms of groups, they function in networks. In networked societies: boundaries are permeable, interactions are with diverse others, connections switch between multiple networks, and hierarchies can be flatter and recursive". Brint [2001] offers a general definition that is based on a synthesis of the 20th century community studies. According to this definition, communities are," […] aggregates of people who share common activities and/or beliefs and who are bound together principally by relations of affect, loyalty, common values, and/or personal concern". Both definitions emphasize the emotional aspect of belonging to a community but allow for a rational interest as well. This is important when looking at communities of multi player games since becoming a better player and beating the game or other players can be seen as rational interest.

This study follows an interpretative approach, meaning that it relies heavily on the experiences of members of multiplayer communities [Frey et al., 2000]. This qualitative approach has been taken by studies into community life and this study can be criticized with the same reasons as them. In many cases, the knowledge gained from studying a certain community has quickly become old, becoming a historical curiosity instead of helping to build a general theory of communities, or a larger, more comprehensive picture of the phenomenon under scrutiny [Brint, 2001]. Additionally studies into communities have depended heavily on qualitative methods with observation being the main method of data collection. Studies into games utilize typically at least one of the following three approaches to data-collection. First, researchers can look at game design, mechanics, and rules. Second, they can gain information from others who play, for example by observing their play or by listening to their experiences. Third, researchers can play games themselves. These three approaches are not mutually exclusive, and are often used in tandem. [Aarseth, 2003; Kolo and Baur, 2004]. In this study we explore each one of these three approaches to some extent.

General, descriptive definitions are too broad to be useful when looking at a specific context like multiplayer games. In order to understand what community could mean in the context of multiplayer games, we need to look at the building blocks behind the general definitions. First and foremost a community must have at least some level of social interaction between community members. This social relationship is long term and can be demanding. These sustained relationships between community members form the basis on which social identity is built, that is, the community members' reciprocal conceptions of themselves and each other [Jenkins, 1996]. Second, members of community must experience feelings of similarity on some level, so to be able to share something important with another member of the community. It could be a concrete action like playing an online game together or a concept such as belief system. Third a community process revolves around a shared symbolic reality or activity. The existence of community means a split

between the inside and the outside reality. Where the ones on the inside take part in specific communication events and have detailed knowledge of the rules and other factors that form the community. Furthermore, this kind of communication usually takes place within an identifiable place, a common public space of sorts [Jones, 1997]. These give us some of the prominent reasons why people build and join virtual communities most commonly to socialize, work together and have topical conversations.

In 2001, Etienne Wenger published the results of a survey of community-oriented technologies that included a classification of them. In this report he presented a graphic representation of the market of community-oriented technologies in relation to the needs of communities of practice. Wenger's graph is reproduced in Figure 1. The figure shows eight categories of related products.

- Desktop of the knowledge worker: complete portal-like applications for managing participation in multiple groups
- Online project spaces for team work
- Website communities, such as customer communities, where the management of membership is important
- Discussion groups typically targeted at communities of interest with little commitment to a shared practice
- Synchronous meeting facilities, online auditoriums, conference rooms, and chat
- Community-oriented e-learning systems
- Access to expertise, through questions or expert profiles
- Knowledge repositories.

All of these product categories represent activities that are important dimensions of a community-based knowledge strategy.

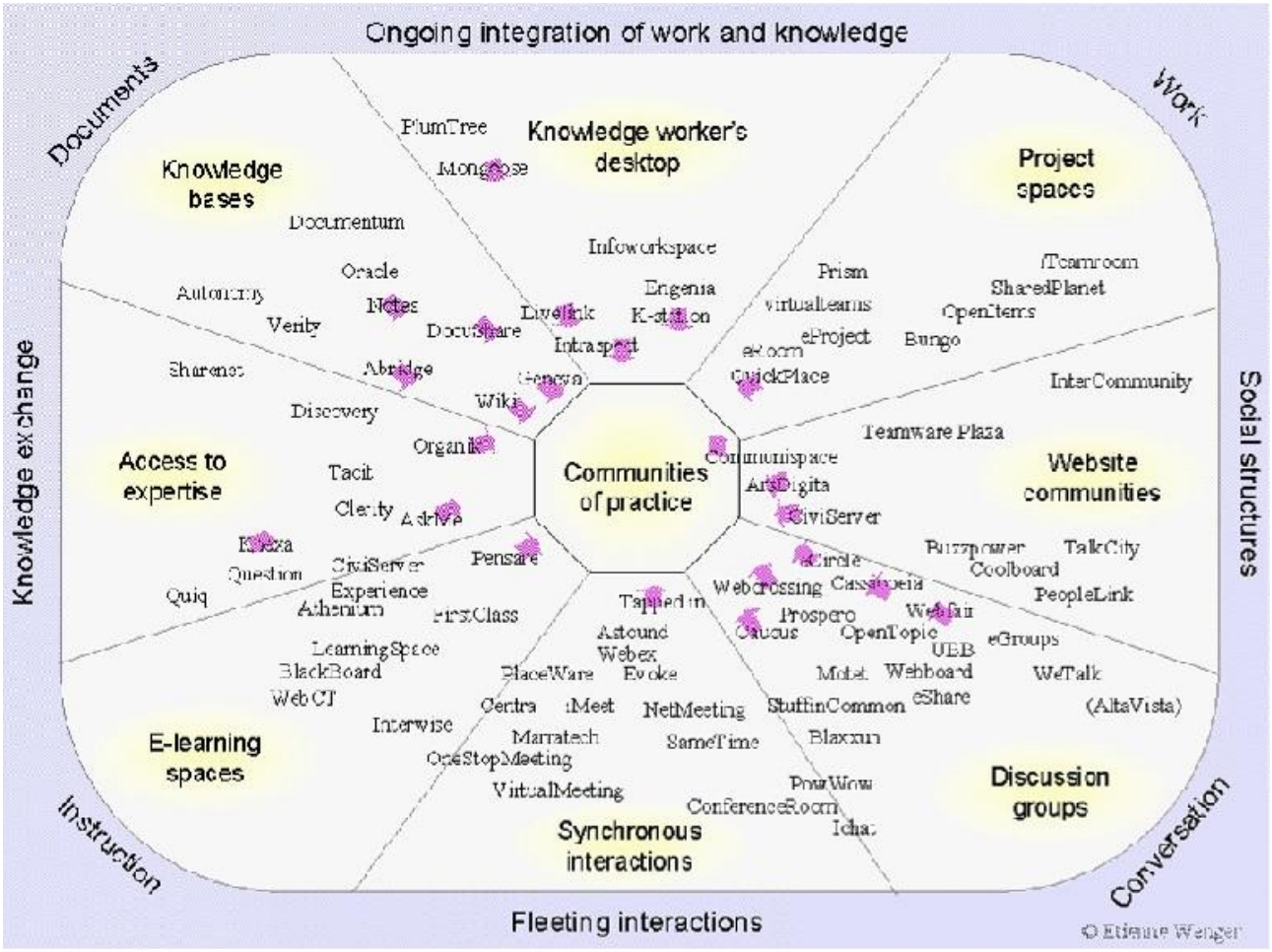

Figure 1. A graphical representation of Wenger's taxonomy [Wenger, 2001]

According to Wenger, web communities support more or less tightly connected communities across organizations and their boundaries, including customers, suppliers, partners, and employees. He further goes on to state that these systems usually have somewhat more complete community capabilities than the discussion group systems, but like them, they focus on communities such as customer or supplier groups, which can remain rather loose. Some typical features of such communities are member identification, profile, chat, discussion board and administrative tools [Wenger, 2001]. The next section discusses a breief overview of these characteristics.

1.6 Community characteristics

Member identification is a key characteristic of a community. This is a mechanism through which a member of the community can identify themselves to the system and other community members. It can be a user name assigned by the system to the community member or self chosen by the member. Once a member is identified and stored in the community system they can continue to create their own profiles. A profile represents a member's personal interest, hobbies and some personal information such as date of birth and location. It is a representation of their selves - to

others to peruse, with the intention of contacting or being contacted by, to meet new friends, find jobs, receive or provide recommendations and much more.

Discussion boards are also known as forums and are used to pass messages between different members. These messages are normally part of some common point of interest that members want to discuss on the forum. Chat or instant messaging is the most common and simple way of communication with other members. The creation of new media has also made it possible to compliment audio and video with a variety of communication tools including chat, shared whiteboards, and advanced information visualization. Synchronous text based communication in the form of chat and Instant Messaging (IM) is one such new media that is seeing widespread standalone use in the workplace [Handel and Herbsleb, 2002; Herbsleb and Atkins, 2002; Isaacs and Walendowski, 2002; O'Neill, 2003]. Despite generally being viewed as a "media-poor" [Short et al., 1976] form of communication, chat and IM have shown to be effective for supporting spontaneous communication [Nardiet et al., 2000]. Instant messaging is near-synchronous computer-based one-on-one communication. With a fast network, message transmission times are fractions of a second and the experience is of near-synchronous interaction. Like chat, IM allows users to type messages into a window, but like the phone, it is based on a dyadic "call" model. Users do not go into "rooms" to converse with whomever is there; instead there is a single individual with whom they communicate (although they may have several concurrent dyadic conversations with different individuals in progress at a given time).

In the next section we will discuss some of the existing virtual communities that are constructed with these features, we will go on to discuss what importance these features have to the existing communities.

1.7 Available communities

Today people are part of several different kinds on online communities, such as knowledge based communities, social networking communities and e-learning communities. While all these communities can be used for different purpose they all provide some centralized mechanism of social interaction. Some provide access to member's personal profile while others prefer to keep their members anonymous. Nevertheless, these example applications provide state of the art for the most important web based community tools and thus provide a scope of sociability for a community platform. These example communities are discussed in the following subsections.

1.7.1 Social networking communities

In order to comprehend the basics of social networking communities we first need to understand the concept of social capital. Social capital refers to the resources accumulated through the relationships among people [Coleman, 1988]. It is a sociological concept, which refers to connections within and between social networks. Bourdieu and Wacquant [1992] define social capital as the sum of the

resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition. The resources from these relationships can vary in function based on the relationships themselves. Social capital allows the members to draw resources from other members of the network. These resources can be useful information, personal relationship or the capacity to organize groups [Paxton, 1999]. Social capital researchers have found that different forms of social capital, including connection with friends and neighbors, are related to indices of psychological well-being, such as self esteem and satisfaction with life [Bargh and McKenna, 2004]. The internet has been linked to both increase and decrease of social capital. Some researchers have claimed that online interactions may supplement or replace in-person interactions, mitigating any loss from time spent online [Wellman et al., 2001]. Internet based linkage is important for the formation of weak ties that serves as the foundation of ridging of social capital. This is because online relationships may be supported by technologies like email lists, picture directories and search capabilities [Resnick, 2001]. Donath and Boyd hypothesize that social networking sites could greatly increase the weak ties one could form and maintain, because the technology is well-suited to maintaining such ties cheaply and easily [Donath and Boyd, 2004].

Social network sites such as such as Friendster [Friendster, 2009], CyWorld, [CyWorld, 2009] and MySpace [MySpace, 2009] allow individuals to present themselves and establish or maintain connections with others. These sites can be centered towards work-related contexts such as LinkedIn [LinkedIn, 2009], romantic relationship initiation [Friendster, 2009], connecting those with shared interests such as music or politics [MySpace, 2009], or the college student population which was the original incarnation of Facebook [Facebook, 2009]. Participants may use the sites to interact with people they already know offline or to meet new people. The online social network Facebook enables its users to present themselves in an online profile, accumulate friends who can post comments on each other's pages, and view each other's profiles. Facebook members can also join virtual groups based on common interests, see what classes they have in common, and learn each others' hobbies, interests, musical tastes, and romantic relationship status through the profiles.

1.7.2 Gaming communities

Unlike social communities where member’s interest can be much different from one another all gaming communities’ members have a common interest of gaming. With the upcoming popularity of computer games the related online gaming communities have also grown. Now days there are many gaming communities but they can be divided into two main groups; general gaming community and game-specific community. The general gaming community provides as many games as possible to attract many gamers and then provide a common discussion platform such as a forum to talk about the games in general. Such communities also provide games with demo games to have a preview before playing the game [Fritsch, 2007]. On the other hand, the game specific communities focus on a single game. These communities have news and content that is specific to a single game. This specialization results in more focused discussions on community forums. The

online gaming communities are prospering continuously, with over nine million members worldwide [Fritsch, 2007]. The massively multiplayer online games are played heavily [Yee, 2002] and often with friends and relatives [Yee, 2006].

Online gaming community such as Gamenet [Gamenet, 2009] and Tactical Gamer [Tactical Gamer, 2009] allow members to discuss top games on forums and provide reviews about new games. Whereas AGAME [Agame, 2009] and ONRPG [Onrpg, 2009] provide several different MMO game and hold tournaments. These gaming communities are solely for entertaining and socializing purposes. Poker [Poker, 2010], gambling community dot com [GamblingCommunity, 2010] and gambling vista dot com [Gamblingvista, 2010] are specially for socializing among online gamblers. These communities provide several different kinds of casino, slots poker and betting games. They conduct gaming tournaments for members to participate from all around the world. These communities enable users to create a gaming profile, join different gaming groups, send messages to each other's and create or join different gaming groups.

1.8 Goals of the Study

This study focuses on Paf online multiplayer gaming community. The main goal is to provide interface and functionality enhancements to currently existing Paf gaming site so that it provides the features mentioned in Section 1.6 and can function as a gaming community. Another main objective is to create a prototype and conduct a user study to evaluate the proposed design changes.

In Chapter 2, the existing Paf gaming system, the motivation to form a community and the design objectives of this study are discussed. After that the proposed concept system and its design motivations are explained in Chapter 3. Chapter 4 includes the main characteristics and requirements of Chat system and Chapter 5 shows the results of the comparison report between 5 chosen software. To evaluate the approach, the prototype for the concept system is explained and discussed in Chapter 6. In Chapter 7, the functionality and usability of the system is evaluated towards the requirements as well as by conducting a user study. In Chapter 8, the discussion and conclusion for the work is given.

2 Existing Gaming Site

In order to evaluate the design needs we first need to comprehend the current capabilities of Paf gaming site. In this chapter first an overview of Paf, its gaming site and site's key logical components, is presented. After that the motivation, design objectives and requirements for Paf gaming community are analyzed. It is important to understand Paf current key component of the gaming site before analyzing and restructuring it into a gaming community.

Paf, founded in 1966, is an association governed by public law, whose goal is to raise money for the public good by offering gaming to the public [Paf, 2010]. Paf is, by the Provincial Åland Government, entitled to arrange gaming on Åland, onboard ships and on the Internet. The existing Paf gaming system offers betting, games of skill, slots, and bingo, poker, casino and lottery games. The existing system has been designed to be a Player-centric, multi-channel and interactive platform. Player-centric means that Paf site enables a personalized gaming experience for the player, while at the same time providing the Gaming Operator (Paf) with tools for customer grouping and direct marketing. Player's life cycle on the gaming site consists of three key processes that are registration, gaming and closing of account.

2.1 Member Registration

Member registration refers to associating certain personal information, such as name, email address, and phone number, with a user. Many applications require user registration. For example, patients have to register before any treatment in a hospital, and participants have to register before a conference. In order to play games on the site players need to provide vital information about them such as social security number banking country and their native language. A pre-condition for gaming and registration is that the player is 18 years old. It is important to point out that registration information is critical for the existing system to function. On the other hand, it is equally important that players trust the system to keep this information confidential. Trust is the extent to which one party is willing to depend on something or somebody in a given situation with a feeling of relative security, even though negative consequences are possible [McKnight and Chervany, 1996]. This definition includes the basic ingredients of trust that are dependency on the existing system, reliability of the system and risk in case the system does not perform as expected. The definition suggests that the trust requirements are directly co-related to exposure [Jøsang and Lo Presti 2004]. That is why the existing system requests for both user identifier and credentials from the user. This allows the system to authenticate and authorize real-time identification of each player, thereby preventing fraud. The existing system authenticates the player with a combination of username and password created during registration. Players are authenticated when entering the system as shown in Figure 2. If a player enters a valid user name and password the authentication process is successful, the players lands on the home page of the site.

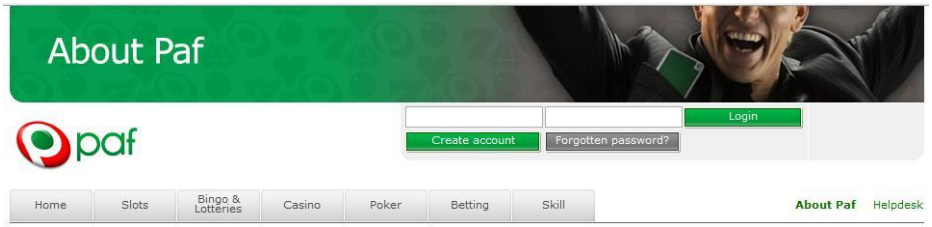

Figure 2. Login page used for player authentication

2.2 Gaming

Before members can start gaming they need to deposit money in the system. This is later used to place bets in games. Existing system has a variety of games, from slots and lotteries to casino games and betting. Popular slot machines are continually expanding on the Internet [Slots.com, 2010]. The detailed functionality of these games is not in the scope of the study, but we will look into a few games to familiarize with the gaming options available in existing system. The slots are most played games in the existing system. The winnings from the slot machine are determined by a computer program inside the slot machine. The underlying algorithms that the computer uses to create a slot machine game have been described by Turner and Horbay [2004]. The algorithms are also documented by Locke [2001] and Wilson [2003] and by a member from an independent gaming lab [Maida, 1997]. Online bingo games are also available in the existing system. In simple words online bingo is the game of bingo played on the Internet. Normally, balls with a number labeled on them are used in bingo games but online bingo games use a random number generator. Existing system provides a simple chat application as well with every bingo game that brings some level of community experience to the players.

2.3 Motivation, what lacks in gaming site

The most common reason people join a virtual community is to access information [Furlong, 1989; Jones, 1995; Wellman, 1996]. Information can be just sharing of technical knowledge or a recommendation about a social issue. Another reason why people join virtual communities is for the social support that the community members can provide. Social support is "the degree to which a person's basic social needs are gratified through interaction with others" [Thoits, 1982]. Social support could also be linked with member's motivation to join groups because of the sense of belonging it contains [Watson and Johnson, 1972] and the way it deals with the need for self-identity [Hogg, 1996]. Other reasons to join a community have been suggested as well, such as people seek others in virtual communities to engage in small-talk with people around the world [Filipczak, 1998; Lowes, 1997; Wellman, 1997]. One main reason to join community is for recreation. This is quite relevant for this study. People join virtual communities to enjoy and play games with other members [Reid, 1999; Utz, 2000]. Virtual community participants think that communities are fun and enjoyable [Wasko and Faraj, 2000].

Internet users are often surprised by the thrill generated by chats and bulletin boards because this software has existed for over twenty years, and although it is now web-based, it has changed relatively little. The following brief review of user numbers indicates the success of this software in the market place. The Internet providers America Online (AOL), for example, built a successful customer base of over 29 million people by understanding people's need to connect. Microsoft Network supports 230 million unique users each month and hundreds of thousands of MSN communities. There are over 104 million ICQ users, and 91,500 UseNet groups. Recently, IBM hosted an online forum in which 50,000 employees worldwide came online to propose and discuss new initiatives [Preece and Diane, 2003]. Player-to-player interaction has a huge effect on player's gaming experience. Communities do not exist without some kind of communication. Online gaming community should provide as many ways to communicate with other players as possible. The more often the player can contact other players, the more likely he is to contribute to the social structure of community [Friedl, 2003].

There are number of different tactics to create a desirable web site. Classical methods to attract customers are good content and usability. Content is the reason why user comes (and returns) to web site. Usability makes sure a user visit goes as smoothly as possible. While these aspects still apply, users are no longer willing to be just passive web page readers. They want to have interactive features, communicate and even create content themselves. Having social contact with other users is especially important [Siitonen, 2003]. Community is created by individuals who interact with each other. During this interaction they learn to know each other and form social structures. These social structures form communities. From this definition it follows that communities cannot be build by gaming service provider. What service provider can do is to provide suitable technical infrastructure to make community forming possible. In web environment this means providing forums, chats, messaging systems, etc [Megler, 2004]. Service provider can also help and speed up social processes. New members can be recruited, interesting topics can be provided to animate discussions, and community events can be organized.

Communities are known to create customer stickiness [Preece and Maloney-Krichmar, 2003]. This means that customers are more loyal and are more likely to come back to website. Communities also provide direct access to user opinions and attitudes. For example, designers could hang around in chat to get feedback on new games. Community can also create channel for marketing. Some communities are created around strong brands (for example, Harley Davidson community) and used to distribute brand values. Some community features, like bingo alerts, can activate members to come to site on special occasions. Social aspects on communities can encourage members to ask their friends to join (word of mouth marketing). Communities provide new rewarding ways to participate. They can ask opinions and advice from other users and except to get honest answers. Users can for example exchange tips and tricks to gain more from gaming. For some members' social status, social contact or even friendships can be powerful motivation to stay in community.

2.4 Design objectives

Design objectives guide the selection of a solution from the number of variable possibilities [Coley consulting, 2009]. It is done by listing the desired features and ordering them by their importance. By ordering the design features the trade offs and possibilities may be more visible in the design of the system. This section gives the basic objectives that have lead to the design of the concept system.

1. *User-centered design* – The design should be user centered and should focus on the needs of the members.
2. *Interface Usability* – User interface should be simple and easy to use.
3. *Security* - Discretionary levels of identity disclosure from show all personal information to show none.
4. *Performance* – Fast reaction time of services on the community site.

In designing the community the focus must be on the needs of the user and must ensure that the selected tools are usable and the technology components have adequate level of performance. In terms of the importance of each factor in communities, Hummel and Lechner [2002] suggested that interface usability such as ease of use and sophistication is of primary importance for gaming communities.

Kollock [1996] believed that member identity persistence, in the form of fixed usernames and user profiles, is necessary in online communities because it allows them to identify other members in the community, know their community history, and trust them. Unrestricted levels of anonymity as opposed to complete anonymity are necessary because they promote relationship building and more private interactions for those members who choose to meet each other in person. Hence, personal information should be kept safe and private but members should be given the option to reveal their own identities to members they select. In this regard, Leimeister et al, [2005] described the implementation of four levels of anonymity in a community for cancer patients that range from "show everything in my profile" to "display nothing". Leimeister and Sidiras [2004] reported that operators and members of online communities value the security and privacy of their personal data very highly. Wegner et al, [2002] explained that, as the community join together, it is important to develop a sense of trust and security among its members. In a similar study Andrews [2002] advised that, in order to encourage interaction, operators must guarantee privacy. Therefore, creators must guarantee that their member information is secure.

3 Concept Community

3.1 Overview

Online communities evolve in stages and each stage has different needs. The design effort to build a community must consider the needs of community members in each stage [Preece, 2000; Andrews, 2002; Kling and Courtright, 2003; Malhotra et al., 1997]. Several researchers have identified different stages of community building. Wegner et al, [2002] identified five stages in building online communities: potential, coalescing, maturing, stewardship, and transformation. Andrew [2002] suggests only three stages: starting the community, encouraging online interaction between members and moving to a self sustained interactive community environment. Malhotra et al, [1997] on the other hand presents four stages of evolution and design: inception, beginning of user involvement, interactivity and growth. In this chapter we focus on the creation or design phase of the community that is earlier referred to as coalescing or encouraging online interaction phase. This phase requires integration of technological components such as email, bulletin board, chat and discussion forums. The creation of the online community begins when these technological components are in place and when the initial group of members can begin to interact and spread the word for other members to join [Malhotra et al., 1997]. Community features can be implemented to any gaming site. But they should be well structured and easily accessible to the players. The following chapter will introduce some of the key community features to the existing system. The study will recommend design modification to the existing system in an attempt to convert it to an interactive gaming community.

3.2 Community Layout

The basic requirements of community usability are the same as for other software products. Software should be consistent meaning have a consistent look and feel, users should be in control of the software, and software responses should be predictable [Shneiderman, 1998]. Other definitions state that software should be effective to use, efficient to use, be easy to learn and easy to remember how to use [Preece et al., 2002]. This section discusses the components of usability; information display, navigation and ease of access for the proposed community system.

Information display includes how easy it is to find information, perform tasks with information oriented goals and how the information designs is structured. Before we investigate community information display alternatives, it is important to consider that existing system is designed to be used with a minimum of 1024 by 768 screen resolution. This requirement exists to ensure users do not have to scroll the screen [Bridgeman et al., 2001]. This requires that all community features should be setup within the same layout. This limits the design options as more

content needs to be presented within the existing screen area. Existing systems main page is shown in Figure 3.

Figure 3. Main page after login process

There are two design alternatives to present the community features to users. One is to present the content in a pop-window and other is to use the existing layout and integrate community feature in it. The pop-up is a mix of popularity and irritation [Kamp, 2001]. A pop-up consists of a small window that pops up over the main browser window and contains text, graphics, and any other information. This small window can jump into sight when one enters a site, browses a site, and sometimes when leaving it [Beard, 2001]. There are certain advantages and disadvantages associated with the pop-up window design approach. The biggest advantage would be the availability of design space on the screen, since this new window can be used only for community features. Another advantage is that members can simply close the window if they want to exit the community or just play without any interaction. The disadvantage with pop-up window is the irritation that they cause users. Pop-up ads are considered to be the most annoying type of advertisement by online users [Coursey, 2001]. Even though community features have no resemblance to ads, presenting them in a pop-up window will have a poor affect on the usability of the design. On the other hand, integrating the community features to the current layout will provide seamless integration and will result in richer experience for the end user. The disadvantage with current layout integration is the shortage of screen space. As the existing site covers most of the area only the right panel in available for any enhancements as can be seen in Figure 3. The design decision needs to be based on the objectives discussed in Section 2.4, considering this the second approach of using the existing layout is used in this study. A wire frame is created to reflect the concept design in Figure 4. As shown all areas of the gaming site are kept as is except the right

column is now designated for community features. This area will contain community features like community membership, chat and member profile.

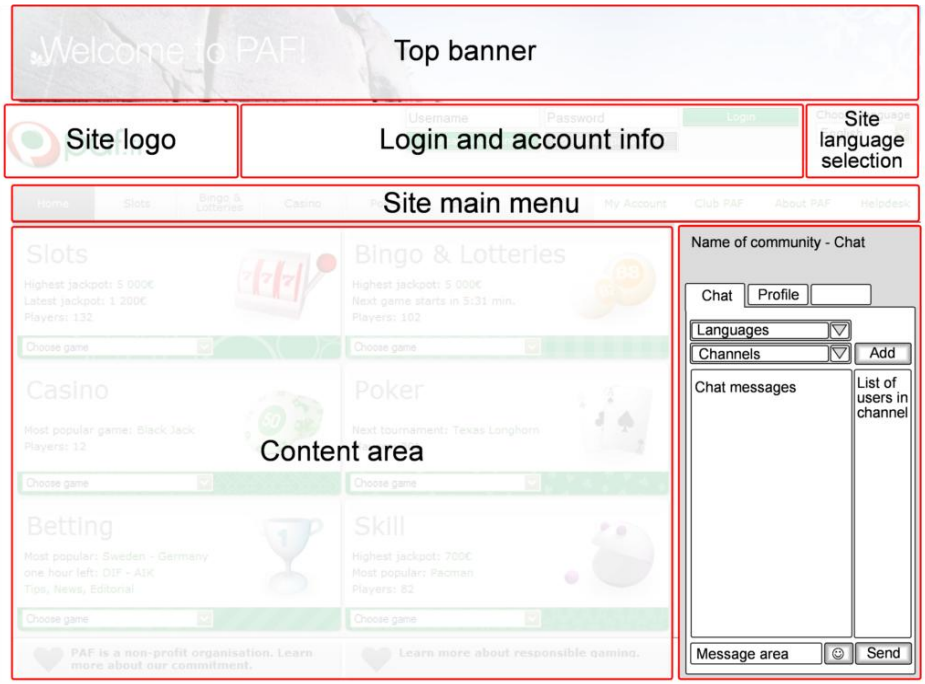

Figure 4: *Community features in community area*

Navigation is another important usability factor for any web application including online communities. It includes important issues such as the length of time it takes to navigate through the community and its associated information resources. The time and ease with which particular information can be found. The user's satisfaction with the navigation system is a key consideration. As the structure of the information display is not always transparent it is difficult for users to navigate in a goal-oriented way [Dieberger, 1995]. Users can become lost because of the non-linear nature of hypertext in web applications [Chen and Macredie, 2002] and, if there is a lot of cross-referencing among different pages, user could end up looping between them [Boechler, 2001]. In order to avoid these issues the suggested design should allow users to navigate to the community area with a simple and easy to use interface. There are two important design questions at this stage that are what navigation options should be shown to users for community registration and where in the existing system should they be presented. The first question has some sociability implication such as what the title content should communicate about the community's purpose? And what kind of policies does the community regulates? These questions simply can be answered by allowing the users to explore the community as anonymous users. This would off course restrict the user's view of community features but allow them to explore the community features. So the proposed design consists of two different options that are "Join the community" and "Explore community". This would keep the navigation simple and also allow users to navigate right into the community features. At the same time a link to frequently asked questions or FAQ is also provided to navigate the user to clear and concise worded policies. To answer the question of where to place these

navigation options is an easy design decision. The community area presented in Figure 4 is ideal for its placement, since this would clearly mark this part of the screen for community purpose from the beginning of navigation. A user interface mock up is created to present these design decisions in Figure 5 and the area to navigate to community features is clearly shown.

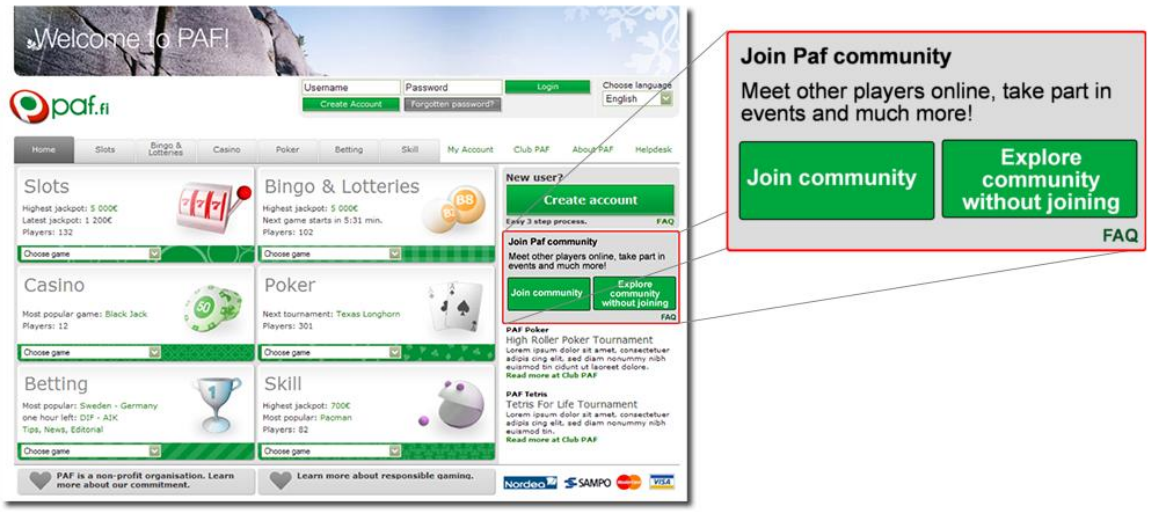

Figure 5.Modified www.Paf.com front page with community option

Existing system supports different languages such as Finnish, English and Swedish. Considering this the proposed system must also provide community features in all these languages. This means that members can communicate with each other in these languages. The language selection is done with dropdown menu in community area as shown earlier in Figure 4. The idea is that if player can speak number of languages then they can quickly select the language that is most interesting for them.

3.3 Community membership

If a user chooses to join the community then they are asked to register. There are two main reasons behind this decision. First in order to allow membership to community we need to acquire some basic user information. The need for selective access control has been identified within previous works on social networking sites [Krishnamurthy and Wills, 2008]. Second is to assure that the users comprehend the community rules and regulations such as what is allowed behavior for members and what is not allowed. Both these requirements are important for the community membership interface design. The interface should also ensure that members have reviewed the community rules before they resister. Considering these the interface needs to consist of input elements as well as feedback elements [Galitz, 1996]. Input elements should be used to acquire member personal information such as a nick name and member acceptance of community rules. Feedback element is required to inform the user about missing information. These need to be presented to the user in a particular order. To be exact first user should be informed of the

community rules, next using some kind of check field the interface should acquire user to have read the rules. And then users nick name should be acquired. Figure 6 presents a wire frame of the proposed interface design. It is important to note that there are two action elements and an alarming red feedback element. If the player has not selected “I have read the rules and accept them” checkbox they will be shown an error message.

Figure 6. Join community dialog

3.4 Community Features

This section describes a list of features that the Paf gaming community will consist. The features are described in detail with the help of mockups and diagrams.

3.4.1 Chat

Chats are important building blocks in making community sites. They provide easy and fast way to exchange opinions and comments. Many of the studies describe how instant messaging is often used to check availability for interactions through other means and how users tended to prefer audio when matters became complex [Nardi et al., 2000; Connell et al., 2001]. Existing chat solution consists of a chat client as a part of a game client. Figure 7 shows the chat window in the Multiplayer bingo classic game.

Figure 7. *Multi player Bingo Classic with chat functionality*

This solution has a few drawbacks. To start with the players can only interact with one another if they are part of this specific game. There is no possibility to contact another community member while playing a slot game or poker. The existing solution is very difficult to use, reason being its small size for chat text content. This results in members not being able to follow each other's messages. There is no way to directly interact with another member of the community since this design propagates all messages to the common chat area. In order to avoid these problems we need to propose a new design that is easy to use. One simple design alternative would be to increase the size of the chat client allowing it to cover more space. This will give members more time to read others' messages. But this still does not resolve the issue of interaction only with in this game client and being able to view other active members to initiate a private discussion. To overcome these issues the chat client should not be part of any game client, but a separate solution. This has number of advantages. One of these is members would be able to navigate to any area of the existing system and still interact with one another. Other is that it will allow more flexibility in the design of chat interface. This can be used to add extra features like language selection and available members list to the interface. It will also result in a more user friendly alternative. A proposed interface is presented in Figure 8 that consists of discussed design alternatives.

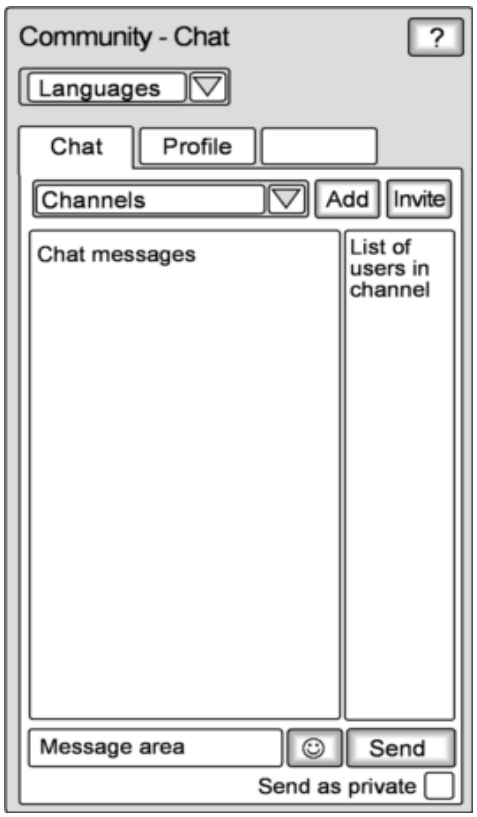

Figure 8. Chat user interface components, for registered member

If a player is not registered in a message area, a button to add smiley faces and send buttons are replaced with text: "Please register to take part in discussion." and link to registration. The add channel and invite to channel button are disabled. The player can read messages in the chat area of the screen. The player can scroll messages written in chat channel session with a scroll bar in the messages area. During chat channel session, a member's username is shown in chat user list. A user writes message to message area. When a message is ready, the user submits it with the send button. Players can send private message to any user in same chat. To do this user checks Send as private checkbox. Then player selects one or many users from list of users in channel. After this user writes message in message area and clicks send. Message written is shown only in senders and selected users chat message areas. Player can change language area with languages dropdown menu.

As discussed in Section 3.1 online communities evolve in stages, and that each stage has distinct characteristics, that must be taken into consideration for community building efforts. In line with this notion is the idea that to successfully advance from the creation stage to maturity requires the gaining of a critical mass of users [Iriberri and Leroy, 2009; Jones and Rafaeli, 2000; Morris, and Ogan, 2009; Preece, 2002; Raban and Rafaeli, 2007]. Community members grow with time and reach a critical mass. If all members are chatting on the same interface it will become impossible to find the person a member is looking for. This presents a need to segment the chat areas. This segmentation could be based on members such as their personal information age, location or place or birth. Or this segmentation could be based on discussion topics. Since this is a gaming community the discussion will be around different games. Considering these scenarios the proposed consists of four chat channel categories. First one, common channel that is open for all members,

second is game type channel that is available from all game categories such as slots and casino. Third is game specific channel that is for individual games such as bingo and cash and carry. Fourth and final is player generated chat. This segmentation of chat channels is shown in Figure 9.

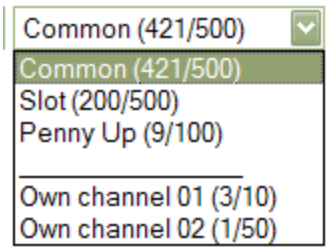

Figure 9. Channels dropdown menu example

3.4.2 Profiles

As discussed earlier in Section 1.6, public profiles provide information about community members. This information is voluntarily given by members themselves. When people communicate in online environment they often want to know more about each other. This helps to form mental image of other person thus aiding communication and personal relations forming. Networking sites, providing category-based representations of a person's broad interests are a recurrent feature [Liu and Maes, 2005]. Such categories may include indications of a person's literary or entertainment interests, as well as political and sexual ones. In addition, personally identified or identifiable information is often provided, together with intimate portraits of a person's social or inner life. The privacy relevance of these arguments has recently been highlighted by Strahilevitz [2004]. But sharing this information also results in issues of trust and intimacy in online networking [Boyd and Friendster, 2004]. Therefore, proposed system should only share member information with their consent. This requires a user interface design that is simple and allows members to share as much information as they like. As discussed it is also useful to categorize this information into groups. Some common categories can be member's personal interests and their gaming interests as well as a category for personal information such as name and area of residence. To serve this purpose the proposed design should allow members to specify all or none of this information. The component layout for this interface can consist of simple input elements with a descriptive label to indicate their purpose [Wroblewski and Rantanen, 2001]. Figure 10 shows a wire frame of such a layout. This information is entered by members and can be edited at any point in time using the edit option on the interface. This provides members with the ability to share their personal interests as well as hide any personal information that they consider private.

Figure 10. Own public profile

3.4.3 Forum

A forum is an online discussion site. It provides an asynchronous communication method. Written messages are often longer than in chat and are written with more care. Most interesting aspect is that since messages stay in site, messages and information in them accumulates over time. This makes it possible to collect information for others to use.

The main function in a forum is free discussion. Users can create own discussion threads and talk about anything they want. This gives users possibility to use their creative freedom. However, community forum can also be used to other purposes. Some forum areas can be created to guide discussion on different topics. For example "Game tips and tricks" can be a forum area where different tips on how to play a game are discussed. Forum can also be used to answer member's questions. The idea is similar to FAQ (Frequently Answered Questions). Different users tend to ask same questions again and again. If questions and answers are visible some users may get their answers very quickly. One possible use for forum is providing channel for ranting and flaming. Wikipedia describes: "Flaming is the act of posting messages that are deliberately hostile and insulting, usually in the social context of a discussion board on the Internet. [Wikipedia, 2010b]" While providing channel for this kind of antisocial activities might first seem foolish there are aspects that support generating this kind of discussion area. Flaming area might work as safety valve where angry users might express their feelings and let excess stem out. Most importantly, these angry messages may have a point. Knowing what members complain can help to improve service. It is important to remember that a good forum is a living creature. It is hard to say in advance what kind of uses it might have in future. Forum is not intended to be used while playing. That's why it will be implemented to a user interface content area separate from the community area. Figure 11 demonstrates forum function. The proposed forum user interface is a simple list based interface where users can see list of all the threads. This allows the members to quickly take an overview of current active discussions [Galitz, 1996]. That way they can choose the discussion

that they want to participate in by simply clicking on it. This will show the details of the discussion and allow them to add their opinion.

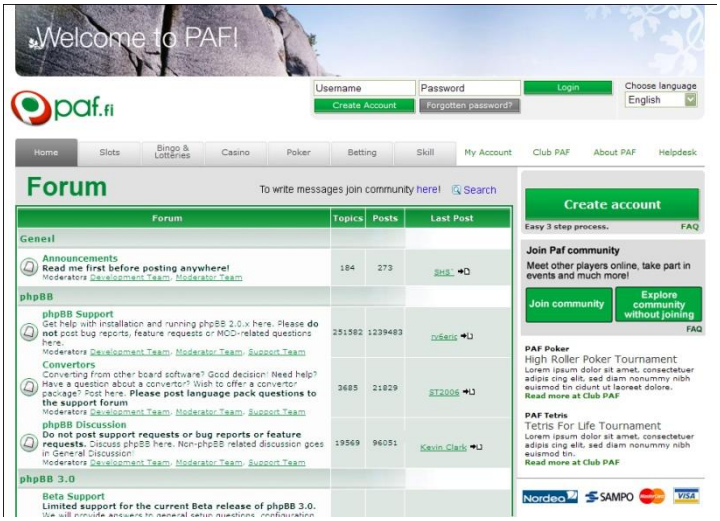

Figure 11 Forum in Paf dot com

4 Community Communication

This chapter discusses the design and functional requirements of community chat management. These will be used to select an off the shelf tool for community chat management. Apart from tool requirements the process of how administration and monitoring should be performed is also discussed. The scope of this discussion is limited to current system and its chat management, although some of the guidelines can also be opted for other social or knowledge based community's management.

4.1 Community Chat Management

Community chat features presented in subsection 3.4.1 are an important part of a community. Even though chat allows players to freely interact with each other and share ideas about the game, it has some negative impacts as well on the community. If left unchecked chat rooms can become play ground for verbal abuse and unnecessary comments. Studies have shown that people tend to create multiple accounts to post negative comments while shielding their identity [Gazan, 2009]. In order to administer and monitor the player's behavior, study proposes chat management and monitoring of players. It is a truism that people will find ways to use systems in ways their designers never intended [Ashby, 2008]. To be able to administer players, a system must be build to create and administer chat rooms. There are many examples where tools failed to support the administrators' activities, forcing them to use clumsy workarounds or self-created tools. Worse, there are studies where the tools functioned in ways that actually caused problems or significantly lengthened problem resolution [Barrett et al., 2004]. This section proposes administration and monitoring features for the gaming community chat management.

4.1.1 Chat room management

Online chat rooms are meeting points that allow people to communicate with other people otherwise perhaps inaccessible. This environment represents an alternative meeting point among the different socially oriented scenarios that increase interpersonal contact. As a result, chat users have developed their own language, a language where speed is more important than spelling. Chat rooms are virtual rooms filled with people interacting with one another and that require some degree of administration. Administering chat rooms mean that administrators are able to create update and remove chat rooms. Administrators also require searching for chat rooms

for the purpose of editing or closing them. A chat room might require closing in case it becomes inactive meaning people do not interact in that room any more.

An important part of administration it to minimize the use of bad language or unwanted names (i.e., swearwords or name of competitors etc.), the administration system should allow to manage a list of words, combinations of words, or parts of a word that will be censored or blocked in the chat rooms. In order to make the monitoring of the chat rooms easier, it should be possible to manage a list of special words, alert words, which shall be highlighted in the chat messages displayed in the chat monitoring window. The point of alert words is to display words such as “Moderators” or “Help” in a different color or font [Galitz, 1996] so that a moderator can easily identify questions to the moderator.

4.1.2 Chat management users

In order to gain access the chat management a chat management user is required to log in to the chat management with a valid user name and password. This is required to allow access only to authorized users such as the administrators. The selected chat tool should be able to create two types of users: administrators which have full access to all of the chat management functionalities, and moderators which only have access to the monitoring functionalities. An administrator shall have the possibility to create new chat management users. To be able to administer chat users the tool should provide possibility to search for them. It should allow administrators to edit any users and change their status. For instance, it could be required to block a misbehaving user of a chat room.

4.2 Monitoring

To monitor generally means to be aware of the state of a system [Wikipedia, 2010c]. Chat monitoring generally means to record, filter or block chat messages to appear in a chat room or as a private message. There are several tools available on Internet for monitoring purpose. These tools allow one to record all chats and instant messages from all the popular chat services such as AOL, Yahoo, MSN, ICQ, AIM, and more. Furthermore they can also restrict the time spend on chatting and log all keystrokes typed, websites visited, emails sent/received, and even capture screenshots of the user's activities. But in general, there is not much research on monitoring chat room conversations. The current monitoring techniques are basically manual [Meehan et al., 2001]. There is an interesting study to determine the most suitable method for the classification of chat sessions logs that would help in automatically monitoring the chat rooms, and in avoiding the manual techniques [Elnahrawy, 2002]. The study results showed that chat rooms can be monitored by using the text categorization methods. The study is not tested with large data sets and is presented for small amounts of data. It requires further work and evaluation. In this chapter we focus on manual monitoring and provide design requirements to monitor community chat. Chat room monitoring, searching, editing chat user profile and chat text search are the main focus of this section.

4.2.1 Monitoring and moderating chat rooms

In order to monitor chat rooms moderators require some mechanism to be able to search and view details of open chat rooms. The chat management tool should be able to search and retrieve all open chat rooms and sort them by number of active users. This will enable moderators to follow most active chat rooms. Using the same search moderators can also join a chat room and observe chat by any user. There are three main design areas that should be available to monitors. First, the moderator can view the list of participants under observation. The list contains participants name, their skill level and a quick link to participant’s profile. Participant name can uniquely identify them in the system and their skill level shows weather they are experienced or beginner chat users. The skill level will provide moderator with the ability to observe beginner level users more closely for miss behavior. When a miss conduct is observed moderators can access the participant’s profiles by in the chat user list. This allows them to view participant’s chat history. The second important area is the chat monitoring window where all messages written by any user shall be visible to the

moderator. This is the main moderation area. In order to support the moderation the proposed tool should provide some mechanism to represent banned words and alert words. One such method could be that the banned words are displayed as italic and red bringing them to focus. While words that are classified as alert word are italic and blue. This support in design will allow moderators to pick up alert words and banned words easily and take appropriate actions towards the message originating participants. The third area is for the moderator to send messages to the participants. These messages can be just a polite request or a strict demand to improve their behavior. Some similar mechanism should be available to users for reading the moderator messages. For instance messages from moderator could be displayed as italic and green so the participants can clearly observe moderator's remarks. Figure 12 shows how these design requirements could be achieved with the help of a simple user interface.

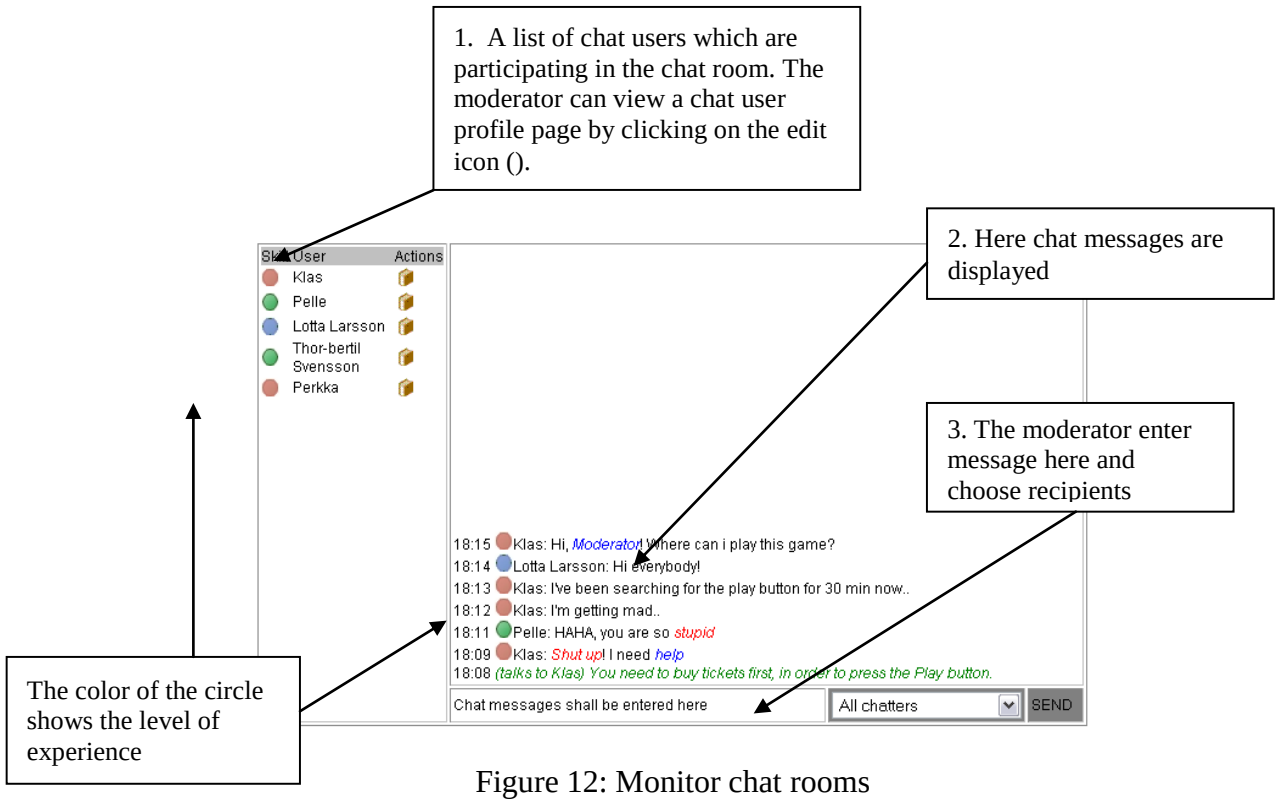

Figure 12: Monitor chat rooms

Chat moderation requires different level of communication between the moderator and the chat participants. To achieve this objective the management tool should allows moderators to be able to send three types of messages: global, public and private. The global message shall be displayed in all open chat rooms. The public message shall be displayed to all participants in the chat room, which the moderator currently is writing the message in, and the private message shall only be displayed directly to a specific chat user.

Moderators cannot be present in all the chat rooms at all times. That is why it is vital for chat administration that all chat messages are stored in the system and the moderators are able to retrieve them when they are needed. A need for browsing archive messages might arise if it is required to observe any previous behavior of a participant. If a participant misbehaves the moderators can quickly browse through participants previous chat history, allowing them to see if this is the first misconduct or not. The design proposes that messages written in any chat room be stored in the system. So that it is possible to search among stored chat conversations. A moderator will be able to search for all messages from a specific chat room within a period. It will also be possible to search for a specific chat user's chat sessions within a timeframe. These search utilities will come in handy for investigation tasks and getting to know the history of member's activities.

4.2.2 Automatic monitoring

The design recommendations presented above are mainly focusing on manual monitoring of chat rooms. In this section we propose some design techniques for automatic monitoring. The main reason for these recommendations is to avoid spamming and misuse of chat features. The management tool should be able to apply certain rules that are automatically triggered when a thresh hold is reached [Xiong et al., 2005]. First, if a chat user writes more than three chat messages in 5 seconds this should be considered as an attempt to spam chat rooms [Wikipedia, 2010d], the result should be that chat participant may not send more messages for the next 30 seconds. This will block spam attempts and result in a cleaner chat room. Second, if a chat user enters more than 20 banned words within 10 min then the chat user shall be automatically kicked out and banned from the chat room for an hour. Moreover, an alert message shall be created which the moderators can investigate in case further action is necessary. This will prevent abusive users from re-entering the chat room. Third, chat user participating in a chat room can report other chat users that are misbehaving. When a chat user has been reported, an alert message shall be created which the moderators can investigate and then take proper action.

5 Community Chat Software

In today's Internet there are various chat systems in use which differ in a number of aspects. Subsection 3.2.1 and Chapter 4 proposes community chat interfaces, layout structure and administrative features suitable for gaming community. These can be considered as requirements for community communication software. There are several such tools available that provide both chat and chat administration for a community web site [Wikipedia, 2010a]. As part of this study, five such software were analyzed. These tools were selected for their usability and claim to function with any existing web site. In this chapter we will discuss a comparison report between this software. Only few of them provide the features that fulfill all the earlier described requirements. Among those tools DigiChat stands out to provide all required community chat features [DigiChat, 2010]. The comparison report will show that DigiChat is most suitable for the proposed gaming community system.

5.1 Comparison Report

A comparison study was done in order to select suitable software for the needs of community chat. Study focused on five such tools. 123Flash chat provides almost all the required features but lacks in usability and graphical interface style [123FlashChat, 2010]. ParaChat is a fast, easy and affordable way to host and manage real-time communication software for web site [ParaChat, 2010]. FlashComs's Community chat is feature-rich, turnkey flash chat application that enables real-time text/audio/video communication for web site users [FlashComs, 2010]. 12Planet Chat Server Software is used to setup community chat rooms, collaborative work discussion space and more real-time communication services [12Planet, 2010]. DigiChat is an advanced Java-based client/server chat program, which has been designed specifically for integration with your existing Web presence [DigiChat, 2010]. There have been similar comparison reports done in the past as well [Wikipedia, 2010a]. We focus on the gaming community specific design requirements. This report is grouped in three parts in order to simplify presentation of the results. These three groups are; community chat features, administration features and monitoring features. These groups reflect design requirements discussed in Subsection 3.4.1 for chat features, Section 4.1 for chat management and Section 4.2 for chat monitoring. Tables 2, 3 and 4 show comparison of chat features. As said earlier DigiChat stands out to provide all required community chat features and this is shown in the comparison results.

Chat Features/ Software	123 Flash Chat	Digi Chat	Para Chat	FlashComs Community Chat	12 planet chat server
Reading messages	√	√	√	√	√
Writing and sending public messages	√	√	√	√	√
Writing and sending private messages	√	√	√	√	√
Adding smiley faces (emoticons)	√	√	√	√	√
Changing language area	√	√	√		
Changing channel	√	√	√		
Creating new channel	√	√	√	√	√
Checking other users public profile	√	√	√	√	
Viewing own public profile	√	√	√	√	
Changing own public profile	√	√	√	√	
Viewing others users profile	√	√	√	√	

Table 2: List of chat features

Admin Features/ Software	123 Flash Chat	Digi Chat	Para Chat	Flash Coms Community Chat	12 planet chat server
Admin user Authentication	√	√	√	√	√
Admin and Moderator Users	√	√	√	√	√
Create Chat room wizard		√		√	√
Chat room name	√	√	√	√	√
Description	√	√	√		√
User limit	√	√	√		
Word filter	√	√	√		√
Spam protection	√	√	√		√
Private messages	√	√	√		√
Smiley's	√	√	√		√
HTML		√			
Search chat rooms		√			
Edit Chat Rooms	√	√	√		
Status		√	√		
Banned words	√	√		√	√
Import from excel or txt file		√			
Alert Words		√		√	

Table 3: List of chat administration features

Monitoring Features/ Software	123 Flash Chat	Digi Chat	Para Chat	Flash Coms Community Chat	12 planet chat server
Monitoring a chat room	√				
Moderating a chat room	√	√	√	√	√
Global Messages	√	√	√		
Public Messages	√	√	√	√	√
Private messages	√	√	√	√	√
User Search	√	√			
Chat user profile	√	√	√	√	
Edit Chat User Profile	√	√	√	√	
Automatic Monitoring/ Rules	√	√	√		
Ban users	√	√	√		

Table 4: List of chat monitoring features

5.2 DigiChat

DigiChat is an advanced Java-based client/server chat program, which has been designed specifically for integration with an existing Web presence. It is a turn-key solution and does not require that community visitors download special chat software to interact in chat rooms. DigiChat brings a host of impressive interactive capabilities to Web presence making it more than just a site. It becomes a living, breathing destination that visitors will return to again and again. DigiChat is apart from other similar tools because it offers visitors a variety of collaborative tools for one-on-one messaging, group chat and even moderated events where guest speakers can participate. DigiChat v5.1 is the ideal Java chat software solution for the Web administrator wanting to incorporate a real-time communication element to their site. DigiChat has built a solid reputation for delivering a sleek and streamlined interface. The introduction of DigiChat's Ensemble interface, has taken this to an entirely new level. Ensemble includes full support for themes, which ensures your end users a consistent look and feel when using online community. An overview of DigiChat and its features are shown in Figure 13.

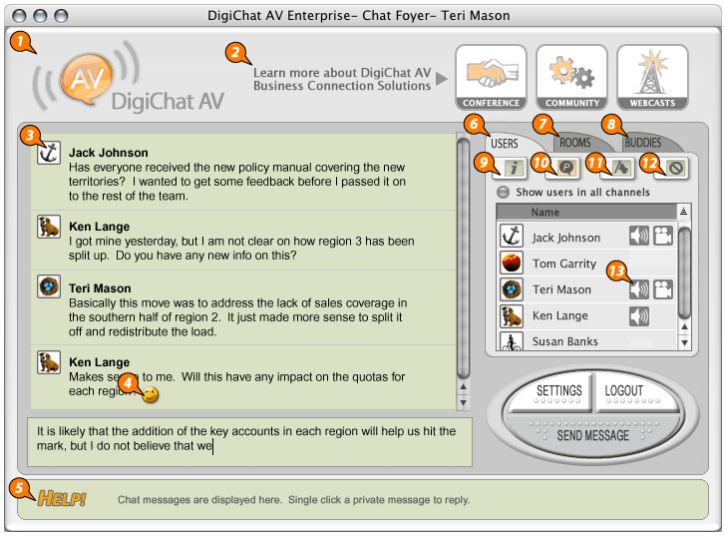

Figure 13. DigiChat outlook

The features of DigiChat include the following [DigiChat, 2010].

1. Sinkable Graphic User Interface (GUI)
   DigiChat allows to re-skin the interface to match the look and feel of any Web presence.
2. Scrolling Animated Banners
   Many businesses and Communities support rotating banners for advertising and special announcements.

3. Customizable User Icons
   A customizable theme can be assigned to users.
4. Emoticon Support
   DigiChat now supports emoticons and even includes a complete set of emotions to enhance the chat interaction.
5. Help at Your Fingertips
   By moving mouse over elements in the interface; you can automatically evoke help messages and tips in the help window.
6. Users Tab
   By clicking this tab you can display users in specific room or across the entire chat venue.
7. Unlimited Rooms and Categories
   As an aid to navigation of chat venues with large numbers of rooms, DigiChat now supports room directories that allow you to set up logical arrangements of related areas.
8. Buddy List
   Aside from the users tab, you may also set up a list of buddies for easy reference.
9. Profile Support
   BY clicking on this button after selecting a user, you may view any personal profile or contact information that the users has volunteered
10. Private Messages
    At any time, a member may select another member from the list and engage them in a separate private chat without interrupting your participation in the main group discussion.
11. Flag Users
    Users can be flagged to monitor later on. They will henceforth be conspicuously identified in the user list.
12. Ignore Users
    I a member encounters an abusive user that they wish to avoid. If an admin is not present to deal with the person, members can simply block any messages from that user.
13. Voice / Video Status Indicator
    Any user that has built-in support for Voice and/or Video interaction will be identified by the appropriate icons by simply clicking the icon users instantly engage in AV chat.

DigiChat's completely open architecture allows customizing the interface in order to suit specific needs. Community may have numerous chat rooms for different

roles or discussions. DigiChat allows organizing rooms in a logical directory structure. This permits administrators to establish parent categories and countless forums within them. Administrators can maintain control over the levels of authority that basic users and moderators enjoy. By setting specific permissions by user, administrators can establish a working hierarchy of users and subordinate administrators that help complete online community.

Moderated chat introduces a series of tools aimed at providing the site administrator with the ability to assign limited powers to discussion moderators and guest speakers. Discussion moderators control the pace and flow of the conversation while site visitors may only pose questions to the moderator (and private message amongst themselves), thereby shielding the Guest Speaker from unruly or repetitive questions or comments. Figure 14 provides a visual reference of how moderated chat rooms work.

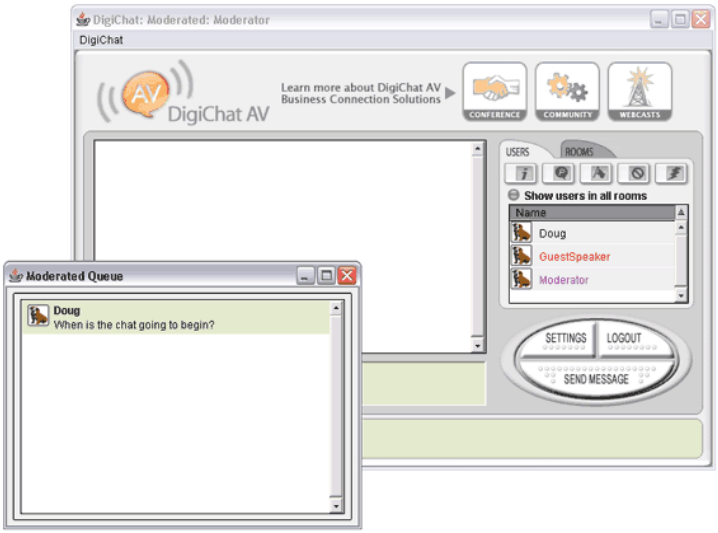

Figure 15. Moderator interface.

Once a moderator clicks on a question, he/she has the option to send the question back to the user, to all users or to the guest speaker. The moderator may also add a comment with any question that he/she forwards. Administrators can send system wide broadcasts to every user in every room. This is useful when you need to get the word out to all members that for instance a gaming tournament has been cancelled.

6 Prototype

In order to evaluate the proposed system in the previous chapters, an example online gaming community with a chat application and a forum was created around the existing Paf gaming site. The aim was to implement a prototype consisting of few important characteristics of the proposed system. The task in this case is to be able to provide a community like experience that means providing participants with ability to join community, chat while gaming and discuss about played game on forum. The requirements and implementation of this prototype is described later in this chapter.

6.1 Requirements for the prototype

The procedure of gathering the requirements for the prototype is described in this section. First a user scenario is presented as the basis of requirements gathering. Then important use cases are derived from the scenario depicting the most important requirements. And at the end of the section functional requirements are acquired from the use cases to be the basis of implementation and evaluation of the prototype application.

6.1.1 User scenario

In this subsection, a user scenario is presented in order to capture the important use cases and functional requirements for this prototype system. The user scenario is an example of possible usage of gaming community. It has been formed together with usability and research team of Paf dot com after analyzing user's behavior on gaming site. The scenario represents a subset of the overall behavior study.

> *"A registered player visits Paf dot com and logs in to the site. Player visits the game page and joins the multi player bingo game. During the game, player wants to share his/her thoughts and comment on the game progress. Since chat is available as a community feature, the player can use that. To make his/her gaming experience more interesting the player can invite his/her friends, also online on community, to join the game. After finishing the game the player can visit the forums and leave his/her comments on the current bingo game session and his/her winnings or losses. Now other users can review the forums and read about the last bingo session and its player's comments."*

Other interesting scenarios are sharing game experience across different games such as between two slot games using text chat or starting a new thread about the upcoming poker tournament on forums.

6.1.2 Use cases and functional requirements

The use cases try to capture the behavior of the system by extracting details from the user scenario [Jacobson et al., 1992]. The use cases are one way of gathering requirements for the system. The basic use cases for the prototype application are

- Join the community.
- Edit community profile and add information to it.
- Starts gaming and communicate with other players using text chat.
- Post gaming experience on the forum for the recent game.

To use these as the basis of functional development these use cases are transformed into functional requirements. The functional requirements specify the functionality of the application and act as reference points for the evaluation of the application. These requirements specify what the prototype application should be able to do and what should be the behavior of the application. Functional requirements describe the behavior of the system, the inputs and outputs and how it works [Kotonya and Sommerville, 1998]. These requirements are gathered from use cases and each use case implements one or more requirement. The following list of functional requirements must be implemented by the prototype application.

- The system must provide a way to join the community.
- The user must be able to select a game and start gaming.
- The user must be able to select a chat room and participate in chat.
- The system must provide a way to add comments on a forum.

Later on these requirements will be used to evaluate the implemented prototype.

6.2 Implementation

This section describes the prototype implementation architecture and design. Since the prototype is build on top of existing Paf dot com, it inherits its three tier architecture [Eckerson, 1995]. So, the application can be divided into three main segments: presentation, logic, and storage. The presentation tier consists of the user interfaces and some client side logic. The main business logic is implemented on the server side through resource oriented service API. The content is saved by the server

side by accessing the native data sources. The implementation can be divided into two parts: the server side and the client side. In the following subsection these implementation details are discussed.

6.2.1 Server-side

The server side implementation is based on REST (Representational State Transfer) [REST, 2010]. REST is a style of software architecture for distributed systems such as the World Wide Web. The term was introduced in 2000 by Fielding [2000]. An important concept in REST is the existence of resources, each of which can be referred to using a global identifier, that is, a URI (uniform Resource Identifier). In order to manipulate these resources, components of the network, clients and servers, communicate using a standardized interface such as HTTP and exchange representations of these resources. The server side implementation was done with Java programming language with Oracle Weblogic application server as the container provider [Weblogic, 2010]. The main classes of the server side implementation are Request handler, model and Services classes. The request controller represents the REST-controller described in previous section and is responsible for handling requests from client side. The model represents the attributes of different entities in the system. The services perform domain specific tasks request to process a request and generate a response. In practice a request handler acts as the controller to utilize different services and return a response in form on the model to the view. The high level class diagram of server side implementation is shown in Figure 16.

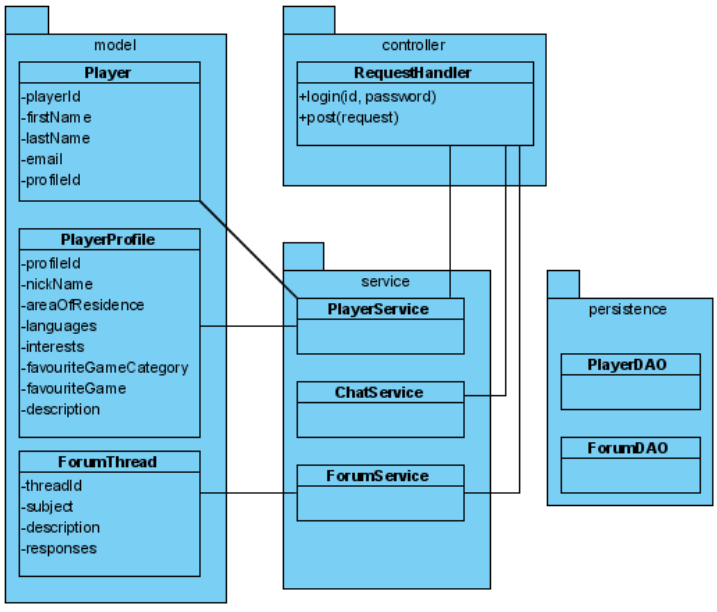

Figure 16. Class diagram for the server side implementation

The Request handler provides several REST bases URI's for the request handling purpose. And each URI provides access to different resources. These resources are programmatically gathered when the request takes place by calling the corresponding method from the request service interface. The request handling procedure includes reading the request, processing the request parameters and gathering the content to generate a response. A code example of login request handler is given in Listing 1.

```
@Path("login")
@POST
@Produces(MediaType.APPLICATION_JSON)
public ResponseMap login(
      @FormParam(PARAM_LOGIN_USERNAME) String username,
      @FormParam(PARAM_LOGIN_PASSWORD) String password,
      @Context HttpServletRequest request,
      @Context HttpServletResponse response)
      throws LoginException {
        if (username==null || username.isEmpty()){
                throw new EmptyUsernameOrPasswordException("User name is
                empty.",EmptyUsernameOrPasswordException.FIELD_USERNAME);
        }
        if (password==null || password.isEmpty()){
                throw new EmptyUsernameOrPasswordException("Password is
                empty.",EmptyUsernameOrPasswordException.FIELD_PASSWORD);
        }
        String siteName = request.getHeader(SSOConstants.HTTP_HEADER_SITE_NAME);
        if (siteName == null) {
           siteName = DEFAULT_SITE_NAME;
        }
   String ipAddress = SSOHelper.getPlayersIpNumber(request);
   String userAgent = request.getHeader(SSOConstants.HTTP_HEADER_USER_AGENT);
        PlayerAuthenticationCallbackHandler callbackHandler = new
        PlayerAuthenticationCallbackHandler(siteName, username, password, ipAddress, userAgent);
   return doLogin(request, response, callbackHandler);
}
```

Listing1. Request handler example for login module using java REST

The services provide a way to access the resources programmatically. The request handler provides a public API to the outside world and can handle several different resources for different data models. The services represent an internal interface to a specific set of resources such as player or forum. The services provide the main business logic implementation for the prototype application. For instance, when the player requests to join a community, the services first execute certain business rules such as checking if the player status is active and the player has a valid SSN. Then it persists all profile information and sends back a success response to the client. A code example of service to authenticate a player is given in Listing 2.

```
@Stateless(name = "PlayerService", mappedName = "player/playerService ")
@Remote(PlayerService.class)
@Local(PlayerServiceLocal.class)
@CallByReference
@Interceptors(SpringBeanAutowiringInterceptor.class)
public class PlayerServiceImpl implements PlayerServiceLocal {
```

```
private static int MAX_HACK_ATTEMPT = 4;
private Logger logger = Logger.getLogger(AuthenticationServiceImpl.class);
private static final int TICKET_LENGTH = 64;
@Autowired
PlayerManagementService playerManagementService;

public long authenticatePlayer(String username, String password,
                               String siteName) throws AccountClosedException,
                               AccountLockedException, AccountWaitingForActivationException,
                               IncorrectSiteException, IncorrectUsernamePasswordException {
   AuthenticationVO authenticationVO = dao.getPlayerAuthenticationData(username);
   if (logger.isDebugEnabled()){
         logger.debug("authenticatePlayer username=" + username + ", " + authenticationVO);
   }
   this.handleAccountAuthentication(username, password, siteName, authenticationVO);
   updateAuthenticationCounter(authenticationVO.getPlayerId());
   return authenticationVO.getPlayerId();
}
```

Listing2. Player Service example to authenticate a player

6.2.2 Client-side

The client side consists of the user interface and the presentation logic. The user interface present the content fetched from the server and presentation logic is responsible for handling the user interaction and the communication with the server. The user interface is described using HTML, the presentational style is described using CSS and the interaction logic is implemented using JavaScript. An important part of client side development using HTML, CSS and JavaScript is the manipulation of the Document Object Model (DOM) [Hors et al., 2000]. Many of the java script toolkits available have a specific way of accessing the nodes in the DOM tree. The same goes for CSS (Cascading Style Sheets); in order to apply styles to an element the element must be selected. All user actions on the client side are handled using event handling. Event handing means the handling of user inputs as well as system inputs, such as the communication events. The binding of event handlers to user interface can be done in many ways. The approach used in the prototype is to bind the objects within the logic part by selecting an element and binding it with the event handler. This has been done using the jQuery toolkit [jQuery, 2009]. Same toolkit is used for Ajax communication between the client and the server. It wraps up the underlying browser specific implementations of the XMLHTTPRequest object and thus allows use of clean and compact code for Ajax functionality. Ajax call using the jQuery toolkit is provided in listing below.

6.3 Design

This section discusses the design of different interface of prototype application. The design has tried to capture specific user tasks of joining community and interacting with other players via chat and forum. The user interfaces in Figure 5 in Section 3.1 is implemented as is for the prototype application. This allows the player to join the community and provide profile information. In order to communicate with other players DigiChat, presented in Section 5.2, is integrated to the prototype as shown in Figure 17. From here player can choose and enter any chat room and when player starts a game that chat room is already available. The interface is designed using HTML and CSS and the user interaction is handled by java script event handling. DigiChat chat application is integrated into HTML as an applet so it is loaded and executed on client's machine.

Figure 17. Community landing page with DigiChat

As with the join community interface the forum interface presented in Subsection 3.2.3 is also part of the prototype. This feature unlike the other does not require player to join community. Hence it is more freely accessible.

6.4 Summary

This chapter has discussed the development of the prototype for the concept system described in Chapter 3 and 4. Both the web server and client side implementation has been described as well as the reference user interfaces for the community prototype

application. In the following chapter both the proposed system and the prototype implementation will be evaluated from the basis of the requirements as well as conducting a user usability study.

7 Evaluation

This chapter provides the critical evaluation and analysis part of this study. The goal is to get an overview of user acceptance and exceptions of the proposed system and to evaluate whether the prototype system fulfils these requirements. The second goal is to evaluate whether the system functionality of the proposed system provides a solution to the research problem at hand. The methods and measurements to achieve these goals are described next.

The evaluation was carried out with a survey and a user study. The survey was conducted to acquire background information about their expectations towards the use of Paf dot com and Paf gaming community. The survey had two parts: the first part was about the whole Paf gaming web site and the second was specific to Paf gaming community prototype. The functionality of the prototype application is evaluated against the functional requirements listed in Subsection 6.1.3. A user evaluation was also conducted to evaluate the usability of the proposed system.

7.1 Survey

A survey was conducted to gather some back ground information from the users. The goal of this survey was to get an initial idea about the important factors in the use of Paf gaming site as well as to access the importance of social interaction among users while visiting the gaming site. This main focus of this was to define some important factors for the design that would be used in the evaluation of the proposed system and the prototype implementation. The survey was conducted as an online questionnaire in Spain and Sweden, since an internal study showed that these two are the growing markets for Paf gaming site. The online questionnaire was sent to over 5000 registered Paf customers in both Spain and Sweden. The survey was open for three weeks and after two weeks, a reminder mail was sent to the participants who had not responded yet. There were in total 444 respondents from Sweden and 188 from Spain. The response rate was 7 % in Sweden and 4 % in Spain. The participants are segmented into three categories: Surprise Entertainment Seeker (SES); Escapist Entertainment Seeker (EES); and Habitual Dreamer (HD). SES is a player gaming from time to time for a surprise win, EES is a player that only plays to escape from daily routine and HD’s are dreamers of a big win such as a jackpot. In total 60 respondents were selected from both Spain and Sweden (every second was picked). In Sweden 20 respondents were selected from each of the three segments. In Spain there were only 10 habitual dreamers, so 25 respondents were selected from the other two

segments. Overall, many of the respondents answered all the questions, thus giving significant value to the results. The results of the questionnaire are discussed as following.

The survey featured sentence completion questions about the importance of usability and interaction with other players. The answers can be used to signify the importance of certain aspects of the application. For example, it was found out that the navigation and ease to understand the web site are more important than interacting with other players while playing online games. Of course, it does not mean that the later one would be less important but what it does reveal is that users perceive and rank the user interfaces and interaction of gaming site quite important.

To analyze some of the design decisions made, it is important to know what people feel is most important in an online gaming site. This is because the proposed system implies that high usability increases player stickiness and is most important while making design decisions. It is important to know what features players require in a welcoming online gaming site. Overall, it seems that people rate usability quite high in an online gaming site. As it is shown on Chat 1, 80% of the participants agree that usability features such as simplicity and ease of use are most important. In addition, 48% of the players ranked the importance of communicating with other players. It seems that these players feel their gaming experience to be more real and exciting while interacting with other players.

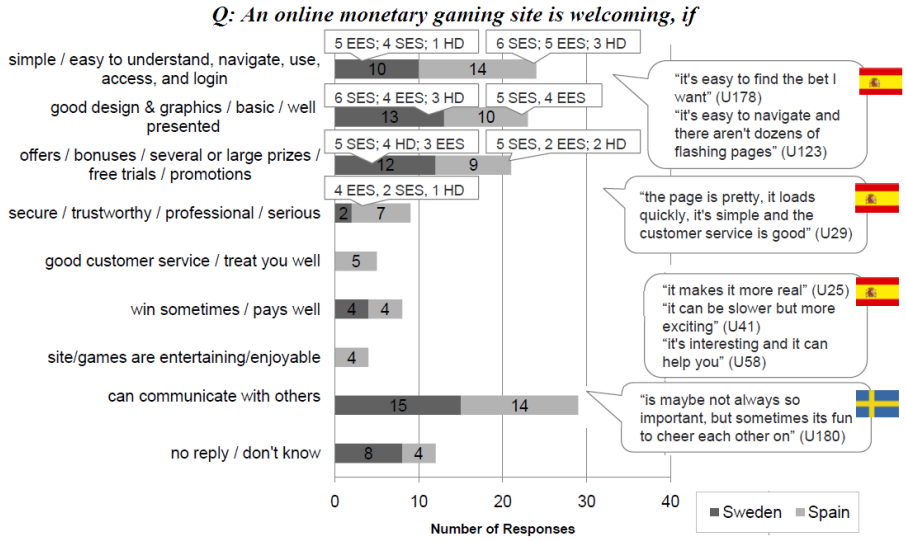

Chart1: The importance of usability and community features

This information gives the use of community features some justification, but also some requirements and challenges as to what come to usability and ease of communication. These challenges have to be answered wile implementing a platform for gaming community.

7.2 Prototype evaluation

The prototype system has been implemented based on the proposed system. Although it does not provide all the possible functionalities, it is extensible and provides a test bed to evaluate the proposed system. The functional requirements for the prototype implementation are listed in Subsection 6.1.3 and they are assessed in Table 5. It is obvious that the prototype system fulfils the functional requirements. This is an initial analysis that is completed with a user evaluation. The user evaluation results are given in the next section, the reference to the corresponding evaluations are presented in the assessment table below.

The requirement	Prototype
The system must provide a way to join the community.	Yes, Chart 2
The user must be able to select a game and start gaming.	Yes, Chart 2
The user must be able to select a chat room and participate in chat.	Yes, Chart 2
The system must provide a way to add comments on a forum.	Yes, Chart 2

Table 5: Assessment of prototype

7.3 User evaluation

A user study was conducting for evaluating the developed community prototype application as well as to gain more insight into the concept from user's perspective. The usability test was conducted as a single user test evaluating the use of community features. The test process is described in the following subsection.

7.3.1 Background

The main purpose of the conducted test was to evaluate the usability of the implemented prototype and thus to test the usability challenges of the proposed user systems user interfaces. In total 11 test users were recruited from Paf organization for this research. The participant's job descriptions were among test engineer, senior test engineer, and usability expert and user experience manager. The ages spanned from 28 to 40 with the median age being 31 years. All participants were experienced users of Paf gaming site but only 50% of the users had gaming experience with a community. The lack of experience from other community web sites was not considered a problem since the aim of the study is not to compare the proposed system with other communities. Both the test and usability engineer had good

experience with evaluating systems for their functionality and usability. This was considered as an advantage for the evaluation process.

7.3.2 Test setup

The test was conducted in a workplace environment. Test accounts for all participants were created before hand in their native languages and the accounts were topped with some initial balance. This could have been done by the participants as well but since it was not the main concern in this study performing this activity beforehand saved participant's time. The test was conducted as an ordinary usability test in an office environment introducing a user scenario and a set of tasks for the user to carry out during the test. The user scenario was adapted from the initial user scenario that was introduced in Subsection 6.1.1 in order to comply with the functional requirements of the prototype. The scenario was described to the user as following: *"You are a member of Paf gaming site. In the test scenario you have a few tasks, which involve joining the Paf gaming community and playing any game you like."*

The tasks were designed to be a set of different activities. The users were asked to complete a set of five tasks. After finishing the tasks users were asked to complete a questioner with a set of questions to evaluate the application. The questions were given in form of statements about the use of the application with multiple choice answers from 1 to 5, stating how well they agreed with the statement. The statements were for example "joining the gaming community was easy" or "finding the person you want to chat with was fast." The answer scale was put in a literal form, varying from "*completely disagree*" "*completely agree*". The questionnaire follows the questionnaire style for user interface evaluation introduced by Lewis [1995].

7.3.3 Test results

The results of the test are presented in this Subsection. The general level findings and the issues discovered are also discussed. In addition to the quantitative analysis of the results, some general comments were also gathered from an interview after the test.

In the first part of the questionnaire the users were ask to evaluate the easiness and performance of the application. For instance participants were asked "Was the application fast to use?". The evaluations were given on a scale of 1 to 4, where one indicates poor performance and four indicates good performance. The results of the evaluation are presented as a bar chart. The bars represent the performance and ease

of use of application on a scale of one to four. The results of the questionnaire are presented in Chart 2. The result of performance related questions are shown with bars labeled P1, P2 P3 and P4. The maximum value given for the performance related questions was 4 and minimum was 2. The overall average value from all participants for prototype performance was 3.3. It is visible from the results that all participants were satisfied with the performance of the prototype. In their comments participants also appreciated the performance of that chat client and how fast it was to interact with multiple participants at the same time. Few of the participants found the forum to be less interactive as compared to the chat client. Their comments were "If I want to discuss a game I would talk about in the game chat room." However other members did leave some comments on the forum even though they were not able to start an active discussion in the short period of test time. The result of ease of use of application related questions are shown with bars labeled E1, E2, E3, E4 and E5. The maximum value given for the ease of use related questions was 5 and minimum was 3. The overall average value from all participants for prototype ease of use was 3.5. Overall participants were quite satisfied with the simplicity of the chat interface and appreciated that its look and feel were similar to the gaming site.

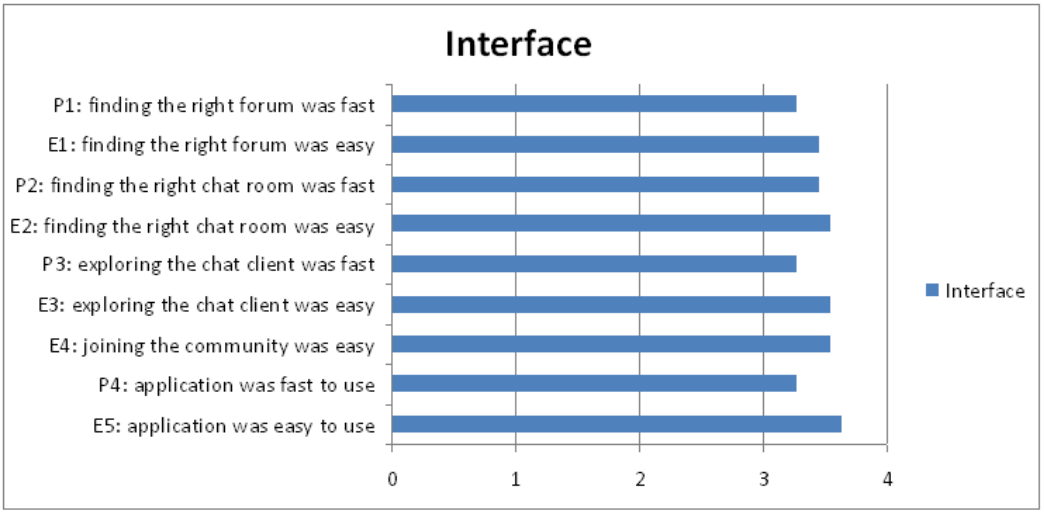

Chart 2. Evaluation of user interface and interaction – The bars represent the average score for each question related to the usage of application.

The users were also asked to evaluate the user interface and the interaction with the application. The results from this part of the questionnaire are depicted in Chart 3. In this part the emphasis was on the suitability of the interface and as well as the structure and navigation of interfaces. In general the pleasantness and liking of use were also evaluated. The result of user effort related questions is shown with bars labeled UE1, UE2. The maximum value given for the performance related questions

was 4 and minimum was 3. The result of user interface interaction related questions are shown with bars labeled I1, I2, I3 and I4. The participants welcomed the one step to community registration and were happy that they had to provide very little information to join the community. This shows that the user interface is close to users' needs and it does not over complicate the community joining process. When asked about the layout changes to the existing system many participants said that they did not notice any changes. Only few realized that the existing layout has been slightly modified to incorporate the community features. However one of the participants reported that the community area felt too small and too many features such as chat and profile were "cramped in" one place. Participant suggested the customization of community area based on members needs. This can be considered as a future improvement since it can allow the members to use as much space as they like for community features. This will allow them to customize the interface to their own needs. The result of user information security related questions are shown with bar labeled S1 and S2. The feature to share or hide profile information was most liked by the participants. Some said that "this would allow them to hide their personal information and they can still participate in community activities". The maximum value given for the ease of use related questions was 4 and minimum was 2. The overall average value from all participants for prototype usage was 3.5.

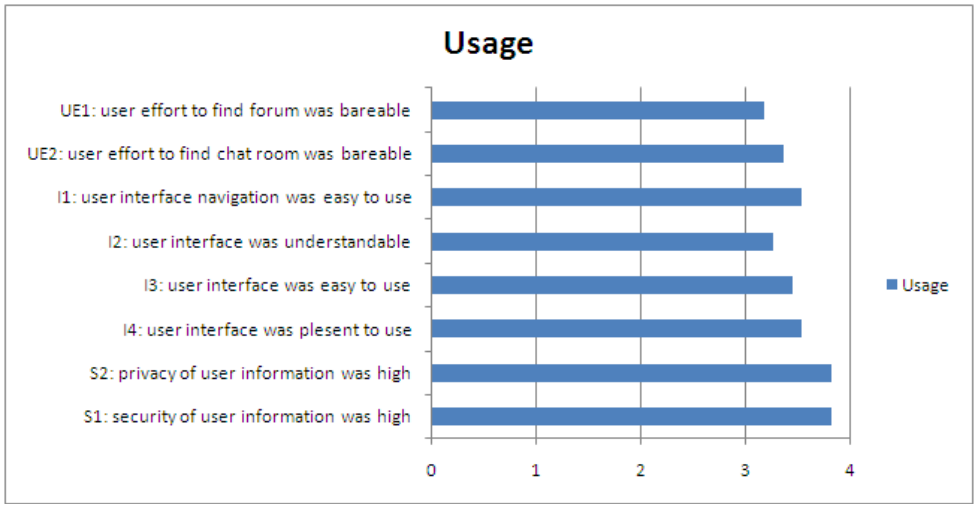

Chart 3. Evaluation of the usage of application – The bars represent the average score for each question related to the user interface and interaction with application.

Overall the prototype results show that the community design improvements were fast and easy to use. This does not guarantee the success of the community but it does provide the community success factors set as design objectives in Section 2.4 of this study.

8 Discussion

Existing gaming site lacks the socialization and player interaction factor and thus restricting the players from having a community gaming experience. This study describes in detail the improvements and enhancements that can give the user interface a face lift and open new ways for players to interact with each other.

It might seem easy to combine varying viewpoints to design and communication in a context such as multiplayer games community and then present a specific design for one community. In practice, proposing specialized design is difficult because of the unknown requirements and behavior of the players. I understand that this is a weakness in the present study. Because I wanted to focus on the Paf gaming community I did not go as deeply into the various game communities as they deserved. On the other hand, the sheer variation within the context of multiplayer game communities that such a task is well beyond the scope of this study. As we have seen in this study, it is common that social interaction in multiplayer communities is not limited to any one mode of communication or technological solution [Taylor, 1999]. A multiplayer community's operation can be divided across multiple modes of communication both within a game and outside of it. The detailed analysis and design presented in this study has been successful in revealing how every Paf graphical user interface should be converted to form an attractive gaming community. Several key components such as structured layout, profiles, forums and integration of content and communication seem to be revealed to almost any approach one chooses to take on design of multiplayer communities. Furthermore, these components vary not only in different domains of multiplayer communities but also in relation to the community's life time. Wellman [1999] gives a similar comment in his review of the concept of community networks, "communities are differently composed, structured, and used in each type of society." There are four common criteria that can help evaluate the value of qualitative research. "The results from such a study should be believable, in that they should seem plausible to the reader; comprehensive in accounting for all (or most) of the data; grounded or tied closely to the data and applicable, leading to testable propositions and additional investigation." [Frey, 2000]. First of all the hypothesis of the work described in Section 1.8 as its goal was that the Paf gaming site can be converted to an interactive ´gaming community by introducing community features such as member profile, chat and forum. The hypothesis was proved to be correct from the technical perspective by implementing a prototype, as well as from the user's perspective by the results from the user study. As a summary, the available design techniques used in this work were found feasible fairly effective to use, off course a lot of future development can be done in order to enhance the user

experience and reliability of the used technologies. In addition to the hypothesis there were four main objectives of the work: user centered design, interface usability, security and performance. The first two objectives were done implicitly during the work, while the later two were evaluated in Chapter 7. We will do a quick summary of these evaluations. First of all the user interface design enhancements were found feasible and useful for the existing system. The evaluation of the design proved that it is easy to use fast and secure. The feasibility of this system was proven by the prototype system and was evaluated by the user study. The conclusion is that adding design and layout changes along with the new community features is a feasible solution. I do feel that the design and tools I ended up proposing in this study provides interesting and important aspects to Paf gaming community. As for being comprehensive, I am certain that I have not covered all the design issues. However, I again feel that I have succeeded in accounting for most of them in a satisfactory manner.

Since the beginning of computer network scholars have had emphasis on social interaction and such an emphasis has been justified with the development and spread of computers and other communication technology [Costigan, 1999]. A great part of Internet research from the 1990s to the 2000s has shown there are several ways in which people use computer mediated communication to both extend real life relationship and to form completely new ones. Now with the enhancement in communication technologies both voice and face to face interaction has become common. As Filiciak [2006] believes, “We cannot, or rather choose not to, live without television, telephones, and e-mail anymore… That is why the dissemination of new ways of thinking which make the real and the virtual worlds equal, is only a matter of time”. Multiplayer games are a good example of how different actors come together to form a cultural landscape. For example, a multiplayer game such as bingo is not constructed by game designers alone but becomes real only through the interaction between the developer and player, living in an independent relationship with each other [Taylor, 2006]. Multiplayer games bring together the “offline” and “online”. Thus, defining what takes place within a game or outside of it becomes exceedingly difficult [Taylor, 2006]. For the players talking and thinking about the game is not limited to the gaming community, but rather is a part of their everyday life. That can include a lunch time conversation with friends and colleges or surfing the internet with intention of finding new online poker players. Paf multiplayer community spans over multiple games and so the community is not bound to a certain game. Hence the presented design has possibilities to communicate from within a certain game or join a channel to discuss other activates. It is also very likely that the

members of current multiplayer community will be involved in other CMC based social networks or have other computer gaming activities.

The question of player's identity has received much attention by the developers, players and researchers of multiplayer gaming community. We are still getting used to the idea that we have much more freedom to shape ourselves than our ancestors did [Filiciak, 2006]. One of the straightforward ways of identification is the player's account name (i.e., email address, username). Other ways include IP address identification and social security number. So in the current computer networks it is possible to trace a person with almost pinpoint accuracy if necessary. A vast majority of players report playing multiplayer games with someone with whom they have face to face relationship [Yee, 2006]. There are many who do not feel the need to use an avatar for their gaming characters. There are services available where a player can provide their photograph beside the information (name, age, email etc.) about their in game character.

Intercultural communities have been another interesting research area in multiplayer communities. The variation in the area makes it difficult to generalize any results. For example, the design and research presented in above chapters is mainly for English speaking players. There are several examples of multiplayer games that function mostly within one national culture or language group, but there are similarly many examples of multiplayer games and communities that operate on an intercultural level. This gaming community under study is available in four different languages to players. Since questions connected to language use and ethnocentrism, both from the point of view of the researcher and of the participants, remain mainly unanswered [Mann and Stewart, 2000], the study suggests the same design and communication techniques for all players.

No matter what view one takes on the development of multiplayer game communities the aspect of communication and collaboration between the players remains a central one, so the game and community developers have to focus their views and concentration on player communication, if they wish for their games and gaming community to be popular. An ideal multiplayer game community should have an easy way to form a social group, very light network traffic for the game, it can consume some resources for chat and there must be lots of variety in games.

9 Conclusion

Since there is no one culture of gaming, there is no one culture of digital gaming either. The purpose of the study has been to provide enhancements in currently existing Paf gaming community to form an attractive and player centric Paf gaming community. Since its origin the field of computer mediated communication has been quite diverse. This variation has made it difficult to present general guidelines for transferring a gaming website to a gaming community. Thus the study has focused on Paf gaming community and its design. Similarly from a communications perspective there is no single entity, but instead we find multiple partly overlapping communication platforms. It is therefore recommendable to observe them from a certain view point or angle. In this study that angle has been defining and studying certain attributes of communication in multiplayer communities. The brief comparison report of communication software provides an overview of the type of development in progress.

In conclusion, there is no indication that we will see fewer social networks operating around multiplayer games. Rather, the constant development of information and communication technologies, we will see new ways of forming social bonds through computer mediated communication. It is most likely that the research into multiplayer gaming communities will expand in scope.

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