Abstract

Many traditional Internet forums have not adapted to the development of the web and their usability standard is low. In order to satisfy this unexplored market segment Zoorum AB is working on a project with the goal to develop a new kind of Internet application for topic oriented discussions. The goal of this master thesis is to design a usable Internet forum, in association with Zoorum AB and Teknikhuset AB. Our challenge was to manage the design process, contribute with competence in interaction and usability and function as a connection between the technology and the users. The result is presented as guidelines for design and visualized in the shape of mock-ups.
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Chapter 1

Introduction

Already before the world wide web was introduced, online computer bulletin boards, also called BBS, were enabled by transmission over phone lines. After the web reached public covering the basic concept of BBS evolved into web based message boards, also called Internet forums [32]. A majority of the applications emerged from the new generation of Internet function as social media [3]. This is enabled by the concepts of Web 2.0 e.g. user-centered design, usability, collaboration, interactive information sharing, open-ness and participation. Today more than 25 percent of the web consumption is related to social media, consequently attractive solutions in this scope of business enables great profitability [38].

Usability is a quality that many products lack, but fortunately methods for usability testing can be applied to increase the success on the market [26]. In present time, Internet forums have not adapted to the significant development of the web and services are lacking usability. Virginia Haffernan described this state in the New York Times [24]:

\textit{Not to get too misty, but the board format itself might deserve a nostalgic embrace. The Internet forum, that great old standby of Web 1.0, has become an endangered species.}

Here lies the motivation of the master thesis: to understand how the traditional Internet forums can adopt the opportunities of the new generation of web technology.

An Internet forum, also know as message board is a discussion site where people can exchange messages and hold conversations\footnote{\url{http://en.wikipedia.org/wiki/Internet_forum}, accessed 2011-07-15}

To go from imagining a product into realizing it in a systematic manner can be done by adopting a certain sequence of events and guidelines, often referred to as the design process [48]. The design process applied in the project
is iterative and consists of a pre-study, design phase, prototype phase and evaluation.

1.1 Assignment

The project propose to design a new kind of Internet application called Zoorum. The business idea intend to satisfy the market segment with a need for new solutions in the area of topic oriented discussions, in other words Internet forums. The challenge is based on the following scope of work: manage the design process, contribute with competence in interaction and usability and function as a connection between the technology and the users.

1.2 Goal

The goal is to design a usable Internet forum. To reach the goal a set of subgoals have been established:

- Understand the needs from the market segment.
- Meet the requirements from the stakeholders.
- Take advantage of the latest generation Internet applications.
- Design a solution that is considered to be usable.
- Visualize the solution in shape of prototypes.
- Evaluate the solution.

1.3 Limitations

The project was primarily limited by time, competence and economical resources constraints. The assigned schedule for collaborating with Zoorum was limited to three months, without any economical support and with few possibilities to use competence from other development departments. Since the practical assignment at Zoorum AB had to end after the first evaluation phase a significant amount of iterative progress was limited.

1.4 Outline

Chapter 2 - Design process

Introduction to the work process mainly used during the project.
Chapter 3 - Usability and usability testing
A literature study is presented in order to study the methodology of usability testing and comprehend the characteristic of usability so the acquired knowledge can be integrated to accomplish the design of a usable Internet forum.

Chapter 4 - Web 2.0 and social media
A literature study is presented in order to explore and understand how features from Web 2.0 can be helpful in the design of a usable Internet forum.

Chapter 5 - Pre-study
Important aspects to cover during the initial phase to obtain requirements.

Chapter 6 - Design
Important aspects to cover during the design phase to develop usable solutions.

Chapter 7 - Evaluation
Important aspects to cover during the evaluation phase to understand the users’ experience.

Chapter 8 - Methods
The methods used during the process presented in a systematic order.

Chapter 9 - Result and analysis
The results from the working process are presented, analyzed and visualized.

Chapter 10 - Acknowledgment
Thanks to those who helped us produce the master thesis.

Chapter 11 - Conclusion/discussion
Thoughts, reflections and evaluation of the final work and stated goals.
Chapter 2

Design process

Engineering design can be described as the process of devising a system, component, or process to meet desired needs. The design process is a way to create a sustainable base for decision making and make sure that the most important aspects are considered. Even though the main goal is to focus on usability realistic constraints like economic factors, safety, reliability, aesthetics, ethics, and social impact are essential to consider [48]. Interaction design is a field where the real users are the main target for the solutions and therefore should be involved in the design. Hence the design can be more appropriate and usable since it will be easier to understand the users’ goals and expectations. One way to learn more about the users is to perform field studies or contextual studies for capturing tacit information [7]. The process used in this project consists of a set components described in the following chapters:

- Pre-study
  - Competitors analysis
  - Market and needs
  - Mental models
  - Requirement analysis

- Design
  - Concept
  - Structure
  - Navigation
  - Social media

- Prototypes

- Evaluation
The process is iterative and allows the requirements to be refined based on the feedback as users and designers engage with the ideas, see figure 2.1. This is vital when the product is innovative since it takes time, evolution, trial and error for the solutions to emerge [37].

Figure 2.1: The design process
Chapter 3

Pre-study

The society is becoming more globalized and people with different background are living among each other using technology, which makes it rare to create homogeneous solutions for one well known target group. Therefore it is very important to understand the intended users and how they interact with the environment. Design research is used in the initial phase to obtain information about the product’s potential, the users and their environment [39]. One important phase and a critical activity in system development is referred as requirement elicitation, which involves information gathering from users and other stakeholders [4]. The purpose is to improve human interaction of an existing or an upcoming system mainly through understanding the requirements by its users. Relevant sources for data gathering in this study are experienced, regular and novice Internet forum users but also established discussion web sites.

3.1 Market and needs

A successful innovation should satisfy the users in a way that no other product is doing at the moment. The market analysis will locate what is available on the market and the creativity should be directed towards alternative solutions based on it [48]. Identifying needs among the intended users is essential since it will create a scope for requirement establishment. The needs help to understand the users, how they work and the context of that work so the design can support them achieving their goals [37]. A set of attributes can be captured to define the user characteristics so the design can be optimized for the correct skills.

3.2 Competitors analysis

A competitors analysis is a method of studying the capabilities and limitations of significant exiting and potential competitors, a strategy to define competi-
tor’s strengths and weaknesses [36]. This strategical approach also applies as a
design research method to obtain vital information about the users, their needs
and preferences.

3.3 Mental model

Designing for interaction often requires a deeper understanding about the int-
tended users to predict their behavior and response to different solutions. Peo-
ple tend to develop knowledge about how to interact with a system, this is
referred to as their mental model [37]. It is perceived based on the users’ cog-
nitive and conceptual model from earlier experiences. Considering the mental
model is a way to understand the users and support the development of an
intuitive experience. After identifying the target group some common char-
acteristics of their behavior can be determined and used to create suitable
requirements. One way to use mental models is to create metaphors that the
users are familiar with to simplify the interaction [10].

3.4 Requirements analysis

According to Robertson and Robertson, a requirement is [43]:

Something the product must do or a quality that the product must have.

It is a statement about the intended solution that specifies what it should
do or how it should be performed. The requirements should be specific, clear
and unambiguous [37]. This is important for the communication among the
team and stakeholders but also since the requirements should be measurable
in the test phase to know when they are fulfilled. Another significant matter is
to prioritize the requirements since it is almost impossible to satisfy all needs
from every user. This should be reviewed and moderated based on opinions
from customers and clients [9].
Chapter 4

Design

This section will describe the development as the process resulting in the end product.

4.1 Concept

Conceptualizing is a creative part of the design where different solutions are developed to fulfill the stated goals and requirements. The ideas created in this phase should be based on the market analysis and the task specification [48]. The level of details should be low so the spread of ideas will remain easy to criticize and modify. The goal is to develop a conception of the design that is easy to learn and fits with the users’ expectations and preferences [9]. Some guiding principles of conceptual design [37]:

- Keep an open mind but never forget the users and their context.
- Discuss ideas with other stakeholders as much as possible.
- Use lo-fi prototyping to get rapid feedback.
- Iterate.

4.2 Prototypes

A prototype is a representation of a design that allows the users to explore it. Prototypes are useful to communicate among members and stakeholders in a project but also for testing the design against users [37]. In the early stage of the development so called lo-fi prototypes are useful for exploration [37]. They are focused on the broader design ideas like content, form and structure. During the initial design phase a lot of different ideas are created and a lot of them are dismissed. Lo-fi prototypes are produced quickly and can be thrown away after evaluation [9].
4.3 Structure

It is of significant matter to develop a sustainable structure early in the process since it will be difficult and costly to modify it later. A successful user interface structure supports navigation, intuitive and optimized access to application data and features. Navigation structure is an essential design element and supports the layout of the web site’s objects and represents the possible sequence for accessing pages. The aim is to supply more accurate information to the users and making it easier to find through usable links and navigation mechanisms [17]. The mental model theory can be applied to predict the response from certain navigation structures.

4.4 Navigation

The design of navigation mechanisms is a part of a web site’s information structure and important areas to consider are labelling, navigation support and searching. Labels are used for links, headings, titles and related areas of navigation and orientation. It is crucial to use consistent and clear representations to fit the users’ expectations and cognitive abilities. It is essential to provide the users with feedback for orientation and easy navigation [9]. Web site elements should be placed in order to support the navigation. A global navigation bar that is maintained through the architecture is a useful example. Local navigation bars are flexible element adjusted to the temporary position.

Content focused web sites requires some kind of organization to enable a usable navigation. Two main concepts to label and organize the content are categories and tags. Both concepts have advantages and disadvantages. Categories are useful to create a lucid view of the web site’s content. But since categories are pre-determined the users’ level of freedom to produce personal posts will decrease. A system based on tags increases the participation and allows the labels to become more specific and flexible, but it will be very hard to control the structure of content and there is a risk for redundancy.

The screenshot from digg\(^1\) in fig 4.1 is a typical example of a categorized web site. Using categories for navigation gives the web site a structure and makes it easy for the users to browse through the content.

The screenshot from citeulike\(^2\) in fig 4.2 is a typical example of a web site using tags to label the content. The main motivation for using tagging includes user interactivity level, user organization level and user interest in the content [18].

\(^1\)http://digg.com/news/business/media/recent
\(^2\)http://www.citeulike.org/home
4.4. Navigation

Figure 4.1: Example of a web site with categories

Figure 4.2: Example of a web site with tags
4.5 Web 2.0 and social media

The following section presents an in-depth study about the most fundamental concepts within the area of Web 2.0 that describes how the development of social media is enabled, in order to understand how it can be utilized in the design of usable web applications. This is significant since Internet forums primarily intend to function as social media.

Web 2.0 is an umbrella term that consists of several different concepts, associated to the new generation of web solutions that are focused on the users’ and their participation [19]. Social media can be described as applications that allow creation and exchange of user generated content (UGC) [3]. It means that a community of users can utilize Internet to produce, share and comment content. Social media supports a rich experience for the users and keeps the content active, but can also be used for promotional purpose to become visible on the market. Social networks, media sharing sites and blogs are examples of popular platforms to communicate with intended users. Statistics show that the three most popular brands online are social media related (Facebook, Youtube and Wikipedia), more than a 25 percent of the web consumers are visiting social networks or blogs and 93 percent of the marketers use social media for businesses [38].

4.5.1 Historical view

It is assumed that the World Wide Web (WWW) began in 1989 when a hyper text management system was developed to be used in the nuclear research center, CERN, in Switzerland. Before 1993 the web was based on command language and with complex syntax controlled only by specialist. But when the first graphical web browser appeared, Internet became available to everyone and the amount of users increased rapidly. The demand for web based services was very high, the prospect for new solutions on the market followed and the so called dot.com bubble was initialized. Many companies based on web technology, during this period of time, reached impractical values on the market in short term but failed to realize the expectations. After the crash in the late 1990s and early 2000s, new kinds of Internet applications, technological architectures and business models emerged from the unfulfilled expectations and the focus shifted from convincing the investors to convincing the users. In 2004 enough had changed to declare a new phenomena called Web 2.0, a result of participation and creativity [9]. Today social media is the number one activity on the web and it’s importance is captured by Erik Qualman [38]:

*We don't have a choice on whether we do social media or not, the question is how well we do it.*
4.5.2 The concept Web 2.0

Web 2.0 is not referring to any specific, well defined version of the web, which the label might indicate, it is rather a series of technological improvement. Main characteristics featured by Web 2.0 are user-centered design, usability, collaboration, interactive information sharing, open-ness and participation. Web 2.0 also means that the line between consumer and producer has become thinner and more content is user generated [2]. Examples are wikis, blogs, RSS, social bookmarking and the possibility to comment published material.

Features emerged from Web 2.0 are usually very collaborative. In order to make the experience rich and user-friendly mash-ups can be applied through open APIs to enable collaborations between applications or data feeds [19]. As David Benyon concludes [9]:

*Web 2.0 has turned the Web into a platform for collective intelligence that crosses devices.*

Using the web today also enables the extension of social context to posted material [9]. Social systems allow the users to tag, rate, like, link, share, comment and much more. Features like these give the content life, fulfill the human need to express themselves, simplify the labeling of content and optimize searching.

Table 4.1 exemplifies some significant features from Web 2.0 that differentiates it from Web 1.0 [33].

<table>
<thead>
<tr>
<th><strong>Web 1.0</strong></th>
<th><strong>Web 2.0</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>DoubleClick</td>
<td>Google AdSense</td>
</tr>
<tr>
<td>Ofoto</td>
<td>Flickr</td>
</tr>
<tr>
<td>Akami</td>
<td>BitTorrent</td>
</tr>
<tr>
<td>mp3.com</td>
<td>Napster</td>
</tr>
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<td>BritannicaOnline</td>
<td>Wikipedia</td>
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<tr>
<td>personal websites</td>
<td>blogging</td>
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<td>evite</td>
<td>upcoming.org and EVI</td>
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<tr>
<td>domain name speculation</td>
<td>search engine optimization</td>
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<tr>
<td>page views</td>
<td>cost per click</td>
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<tr>
<td>screen scraping</td>
<td>web services</td>
</tr>
<tr>
<td>publishing</td>
<td>participation</td>
</tr>
<tr>
<td>content management systems</td>
<td>wikis</td>
</tr>
<tr>
<td>directories(taxonomy)</td>
<td>tagging(folksonomy)</td>
</tr>
<tr>
<td>stickiness</td>
<td>syndication</td>
</tr>
</tbody>
</table>
4.5.3 Business models in Web 2.0

Although the word user-generated is strongly associated with Web 2.0 most of the domains are provided by for-profit enterprise [5]. The new generation of the web is not only driven by the development of functionality, it also contains new ways to make money. Several successful business models have developed from the Web 2.0 age [21]:

Advertising

Advertising is an old technique used to get potential consumers interested in a product or service. The main advantage of Web 2.0 is the possibility to increase the hit-rate by presenting the advertisement in suitable domains. AdSense was developed by Google and is one example of applications that can analyze the users’ behavior and “sense” interesting subjects for advertisement.

Subscriptions

In Web 2.0 more and more companies provides digital services, and function as a platform for the users, instead of selling a one deal product. Users can access the desired service by subscribing to a payment plan. One variant of subscription is the so called ”.freemium” model where the users can access a limited version of the service financed by advertisement for free and subscribe for a premium account to use more advanced features and/or without the advertisement.

Commission based brokerage and merchants

The main idea with brokerage is to bring buyers and sellers together and acquire a commission based revenue. To promote a sales deal the broker can provide services during the purchase procedure like search, product presentation, payment alternatives and evaluation.

Information intermediaries

During the increase of Web 2.0 applications, information about the users’ behavior, their habits and click streams became valuable for many companies. Information intermediaries can collect and analyze data about the users.

Community model

The community model is a result of the Open Source software development where program codes are shared for free among the users. Even though the product itself is non-profitable other services like product support or advertisement can generate revenue.
4.5. Web 2.0 and social media

4.5.4 Social media features

Social media enables interactive communication and connects people through web-based technology. In order to understand how social media can be considered in the design process, and applied in a usable Internet forum, a set of concepts has been explored.

Social bookmarking

Social bookmarking systems let the users assign tags or keywords to content and place it in a public venue to make it visible to others. Founded 2003 Delicious was the first site to enable tagging and formed the concept social bookmarking, other examples are Digg and Citeulike. The idea with a user generated, collaborative taxonomy, also called ”folksonomy” is meaningful because it reflects the users’ terminology [23]. A bookmark can be created for at least two purposes, first made by the individual to organize and remember the URL, second made by the community to guide other users to adequate information. The accuracy and creditability of the second scope of use can be questioned, but bookmarks published on the popular site Delicious though, are concluded to be overwhelmingly relevant and objective [35].

Social media sharing

Sharing refers to exchange, distribution and receiving of content. Media sharing occurs on the web to collect, compress, upload, host and distribute different kind of media. Sharing alone is mainly an interaction in a medium and does not imply any social attributes [25]. But if the content is published in a social network, for example Youtube or Flickr, the outcome might be influenced by the context, i.e. users can add meta data and create links through a social system. The potential benefit from adding social context to shared media is the opportunity to collect and analyze users opinions and activities to obtain trends, measure the quality and reason about the content [30].

Social networks and virtual communities

A social network is a social structure made up by individuals linked together by some kind of mutuality. Lately social networks tend to differentiate themselves from a community of individuals and rather become a ground for individual communities, where the purpose is egocentric. Some kind of personal profile is supported to present the users, often including avatar, photos, friends and interests [5].

A virtual community that exists on Internet, also called online community, in addition to social networks is focused on the group rather than the individual members which are connected by mutual interests. The motivations why people use virtual communities are the need to belong, providing each other with information, help achieving goals, distribute rewards and form social identities
from the membership [11]. Furthermore, research about the subject indicates that online communities often develop norms, behavioral standards and internal hierarchies [5]. Today wide parts of the society suffer from a lack of free time and are constantly stressed by surrounding demands. Here the virtual community fulfills the continuous social contact members in a community need between each other to maintain the network.

Facebook

According to the statistics presented in Facebook’s press room they, as of fall 2011, have over 750 million active users where at least 50 percent are signing in daily, this makes the platform the largest social network in the world. In various forms Facebook applications are integrated in more than 2.5 million websites [15]. Obviously the features powered by Facebook are a popular way to create a social event from any given situation. Since the software is developed using open source from the initial state it is easy to reuse the infrastructure in new appliance. Making recommendations, comments and share opinions is no problem using the predefined social plugins [16].

Twitter

Twitter, in contrast to Facebook, have a lot more narrowed scope of use which can be described as micro blogging. Initially Twitter only allowed text based posts of up to 140 characters, but now supports embedded multi media. The software is using open source for some projects, but since the service is not multi functional it is only necessary to share the most vital information for developers outside the company.

Blogs

Historically a blog is diary with published chronicle events in the writers life. Practically a blog is a web page that easily can be modified by the users and have the ability to add content regularly. Compared to a traditional website blogs always encourage social interests [40]. Everyone can easily initialize a blog in less than five minutes and communicate with the readers. Wordpress and Tumbler are popular examples of platforms used for blogging.

YouTube

YouTube is a video sharing website, i.e. a platform to upload and share a wide variety of user generated video content. Members can produce and upload content while everyone can consume it. Lately the web site has become a domain also for commercial marketing and many companies communicates through YouTube channels. When it started to grew a lot of videos, not originally created by the users, were uploaded. This exemplifies one criticized implication of
media sharing: the inability to ensure that uploaded content apply the copyright laws. YouTube constantly attempts to developed a system to control the video stream and identify violations [25].

Internet forums

An Internet forum can be considered as a typical kind of application developed in Web 2.0. It is a social medium that enables the users to participate, share, comment and collaborate on content. But in fact Internet forums have been available on the web for decades and already in 1994 the web based forum WIT was created. Mainly, users post content that is organized by a thread structure where the replies are linked together from first to last post. A bulletin board software is used to automate the administration. The platforms for web based discussions are plenty, for example Google groups, Yahoo! groups, phpBB based sites and vBulletin based sites. Forums on the web range from freely available versions online to completely closed versions for internal use within an organization behind a firewall. Internet forums are usually centered around a subject and the content can be organized by subtopics to support the browsing. It is also essential to search for posts in a forum, either internally from the site’s search application or externally from a search engine like Google. Unfortunately it is not always easy to judge the quality and creditability of the content and find out how active the users are within an Internet forum [32].

4.5.5 Reflections

This section is describing present conditions and is a part of the theoretical base. Internet based solutions are developing rapidly and the progress is hard to predict. One conclusion seems clear though, social media is a popular topic in the context of Internet ³. The web is a place with a constant need to provide social interaction and support peoples everyday life. The scope of use for social media is wide and features can be implemented in various ways and social context provides a dynamic life to the content online. External social media applications can be considered from a promotional aspect but also for the users’ benefit. The study indicates that most Internet forums available on the web are lacking features enabled by Web 2.0, and the connections to other social media are few, although the possibilities are plenty. The information adverts that understanding Web 2.0 and social media is a great strength to develop a web based discussion forum.

Another aspect to consider is how to bridge the the digital divide and the approach toward digital content. Not only technological access is critical, it is also necessary to consider the current attitudes among people [34]. Social media should continue to focus on the users’ needs, not explode in functionality, in order to avoid a "social bubble", compared to the dot.com bubble.

Chapter 5

Evaluation

This chapter will emphasize the theoretical background that can be useful during the evaluation phase, concentrating mainly on focus groups, usability and usability testing.

5.1 Focus groups

A focus group is a group interview that is focused on a collective activity to exploit benefits from the communication in order to collect data [28]. The main advantages using focus groups for the project follows:

- It contributes with diversity to the evaluation and detects sensitive issues in the design [28].
- It encourages open conversation about embarrassing subjects [27].
- It highlights conflicts and consensus among the participants [37].
- It produces a wider range of information, insight and ideas [12].
- It allows spontaneity among the participants [12]. Since the group can express themselves freely no data is forced and the responses will obtain high quality.

Prepare the focus group

It is important to be well prepared and familiar with the material used for the interview sessions [31]. When designing a focus group the problems and the goals must be clearly defined. This is critical because the research questions will be formulated, the moderator will emphasize subjects, and the population will be recruited, with consideration to the definition. The sampling frame in the focus group will consist of the participants. They need to be identified
with respect to a potential market since they will represent a larger target population [12].

**Moderate the focus group**

The moderator’s skills depend on the abilities to make quick judgment, to control the discussion and to interject in the right situations. A good moderator is flexible, sensitive, has humor, links ideas together and encourage the participants. At the same time leading questions and judgment of comments should be avoided. The design of the focus group guide and the moderator’s knowledge about it is also significant [31].

**Documenting the focus group**

Video or voice recorder should be used to get authentic material from the session combined with a note taker. The note taker is responsible for documenting non verbal information from the discussion as a complement to voice recording or videotaping. Notes from the focus group should be well structured, all communication and participants should be referred to correctly [31]. Within 15 min after the discussion ends the note taker should conduct a debriefing session together with the moderator to clarify ambiguities.

**5.2 Usability and Usability testing**

This section contributes with a theoretical framework to support and understand good user interface design. Conducted through an in-depth study on significant components of Human-computer interaction (HCI) and interaction design i.e. usability, and usability testing. The study concentrates on the criteria, meaning and the main aspects involved.

Modern technologies, such as the personal computer and smartphones offer interactive systems that is not only exclusively used as a work oriented resource but also utilized to achieve personal enjoyment. The primary focus is therefore addressed to the users’ personal encounters and experiences of such interaction [13]. User interface design and the research methodology applied to it, has become an interdisciplinary approach to grasp the significance of needs, views and goals by the provided or of the contemplated users. It is a suitable strategy for effective human-computer interaction [6]. This is why usability as a quality and usability testing as an evaluation method is a crucial phase in each stage of the process of designing useful and usable products or services, the eventuation is the elimination and minimization of user frustration [26].
5.2. Usability and Usability testing

5.2.1 Historical views

The general understanding and the attempt to define the term usability has undergone many modifications throughout the decades, it became generally known to the system developers due to the growing criticism towards the lack of focus on the users. Following notion is an attempt to provide a greater understanding considering usability:

*Any system designed for people to use should be easy to learn (and remember), useful, that is, contain functions people really need in their work, and be easy and pleasant to use* [22].

The introduction of ISO (International Organization for Standardization) usability standards during the 1990’s was an important event. This provided guidance by gathering together all the relevant aspects and concepts considering human-computer interaction and describing them as principles [13].

5.2.2 Formal definition

One of the earliest known attempt to define usability is the modified and developed formal definition:

*The capability in human functional terms to be used easily and effectively by the specified range of users, given specified training and user support, to fulfill the specified range of tasks, within the specified range of environmental scenarios* [42].

Part eleven from the ISO 9241, is one particular part covering usability, titled Guidance on usability:

*This part deals with the extent to which a product can be used by specified users to achieve specified goals with effectiveness (Task completion by users), efficiency (Task in time) and satisfaction (responded by user in term of experience) in a specified context of use (users, tasks, equipments and environments)*  

The first definitions is a generalization and in a conceptual form of the field of usability, but it do not cover the aspect of collecting quantitative data i.e. measurable data. However the latter one attempts to address this problem. It enhance the measurable aspect of usability and classifies it into three categories: *effectiveness, efficiency, satisfaction*.

---

5.2.3 Framework

In addition to the formal definitions a set of terms are declared to explain specific aspects of usability [8] (table 5.1). These aspects and the formal definitions deals obviously with the quality of usability and how it can be used as a model, tool and for evaluation of a system, product or service. Nevertheless, the absence of the concept enjoyment i.e. to experience joy or pleasure, as a goal in usability has been criticized by designers. Therefore a new model emerged from a expanded version of the characteristics from IS0 9241-11 (effectiveness, efficiency, satisfaction), titled the five dimensions of usability. These dimensions are effective, efficient, engaging, error tolerant and easy to learn. Their separately significance describe the aspects of user experience (table 5.2) and by combining them together it can be used to connect experience and usability [1].

Table 5.1: Usability aspects [8]

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learnability</td>
<td>The time and effort required to reach a specified level of use performance (also described as ease of learning)</td>
</tr>
<tr>
<td>Throughput</td>
<td>The tasks accomplished by experienced users, the speed of task execution and the errors made(also described as ease to use).</td>
</tr>
<tr>
<td>Flexibility</td>
<td>The extent to which the system can accommodate changes to the tasks and environments beyond those first specified.</td>
</tr>
<tr>
<td>Attitude</td>
<td>The positive attitude engendered in users by the application.</td>
</tr>
</tbody>
</table>

Table 5.2: The five dimensions of usability [1]

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective</td>
<td>The completeness and accuracy with which users achieve their goals</td>
</tr>
<tr>
<td>Efficient</td>
<td>How directly and quickly those goals can be met, or the speed (with accuracy) with which user can complete their tasks</td>
</tr>
<tr>
<td>Engaging</td>
<td>The degree to which the tone and style of the interface makes the product pleasant, satisfying or enticing to use.</td>
</tr>
<tr>
<td>Error tolerant</td>
<td>How well the design prevents errors, or help with recovery from those that occur.</td>
</tr>
<tr>
<td>Easy to learn</td>
<td>How well the product supports both initial orientation and deepening understanding of its capabilities.</td>
</tr>
</tbody>
</table>
These aspects are interdependent which means that they must be considered together while applying them and the challenge in every design is to keep them in harmony i.e. to maintain equal focus on each dimension to obtain balance [1]. See figure 5.1

![Diagram of the five dimensions of usability](image)

Figure 5.1: The five dimensions of usability

The five dimensions gives many possibilities considering usability which can be applied in several different ways during the design process e.g. set design priorities, identify users’ needs in different context and suggest design approach.

### 5.2.4 Usability testing

Usability testing refer to the technique used by designers in product development to evaluate a product or system i.e. the process which involves potential end users as testing participants to evaluate a product and its defined usability criteria. It is a research tool, with its roots in classical experimental methodology [26]. Usability testing can also be described as follows:

*a systematic way of observing actual users trying out a product and collecting information about the specific way in which the product is easy or difficult for them* [14].

To fully understand the context of performing a usability test, it is essential to consider the basic principles of user-centered design (UCD) approach:

- Early focus on users and their tasks.
- Evaluation and measurement of product usage.
- Iterated design.

Usability testing serves therefore as a technique which helps designers and developers to follow these principles and help them to ensure a good, user-centered design (UCD) [26].
To be able to achieve and conduct a successful usability test, it is important to follow some requirements i.e. features and qualities that facilitate the methodology. The following lists below elucidate these requirements.

**Usability testing characteristics**

- The primary goal is to improve the usability of a product. For each test, you also have more specific goals and concerns that you articulate when planning the test.
- The participants represent real users.
- The participants do real tasks.
- You observe and record what participants do and say.
- You analyze the data, diagnose the real problem, and recommend changes to fix those problems.

**Basic elements of Usability testing**

- Development of research questions or test objectives rather than hypotheses.
- Use of a representative sample of end users which may or may no be randomly chosen.
- Representation of the actual work environment.
- Observation of end users who either use or review a representation of the product.
- Controlled and sometimes extensive interviewing and probing of the participants by the test moderator.
- Collection of quantitative and qualitative performance and preference measures.
- Recommendation of improvements to the design of the product.

Designers and developers have to decide when to apply usability testing into their design process and by doing so it is also important to choose a type that will achieve a certain purpose. Considering the factors related to the specific design process is also relevant when choosing a test type, such factors can be desired goals, the design state and available time. Below follows a description of the three common test types: *Formative testing, Summative testing and Verification testing* [26]
Formative testing

Formative testing takes place at an early stage of a design process while the product or service is in development and being shaped. The objective is to examine and diagnose high-level preliminary design concepts. Knowing how well the user perceive the essential parts of an interface and their impressions are beneficial at this phase. A question formulation such as the one below, can be used to collect that kind of information:

- What do users conceive and think about using the product?
- Does the product’s basic functionality have value to the user?
- How easily do users make inferences about how to use this user interface, based on their previous experience?
- What type of prerequisite information does a person need to use the product?

In order for the user to answer the questions listed above, the designer has to present a preliminary version of the product or service e.g an interface. Depending on whether it is a software or hardware representation, there are several ways to illustrate it. Low fidelity prototypes e.g paper prototypes are used for software representations while hardware representations requires a two-dimensional or three-dimensional model. These representations, in other words the prototypes should be kept simple to avoid confusion and distraction.

Summative testing

Summative testing is the most common test type due to its simplicity and straightforwardness. It is conducted once the fundamental criteria for functionality and usability has been established by the design team. This test will continue to explore further and more extended aspects of the design concept, focusing on lower-level tasks. Investigating how effective and efficient a user perform on realistic tasks and also identifying the problems that are affecting its usability. Although its methodology has similarities to the formative test and the verification test, here follows some differences from the formative test:

- The user will always perform tasks rather than simply walking through and commenting upon screens, pages, and so on.
- The test moderator will lessen his or her interaction with the participant because there is less emphasis on thought processes and more on actual behaviors.
- Quantitative measures will be collected.
**Verification testing**

Verification testing is conducted as a final measurement of usability, exploring whether or not the product or service meets the predetermined usability requirements. The verification test has some similarities to the summative, however the following list distinguish the important differences between this test and the summative test.

- Prior to the test, benchmarks or standards for the tasks of the test are either developed or identified. This can be specific error or time measures, or as simple as eliminating the problems identified in earlier exploratory tests.

- Participants are given tasks to perform with either very little or no interaction with a test moderator. (And they are probably not asked to “think aloud”).

- The collection of quantitative data is the central focus, although reasons for substandard performance are identified.
Chapter 6

Method

The project began due to a first appointment with the CEO of Zoorum AB. This was followed by a workshop about Zoorum’s business plan and target users. In order to have a unambiguous strategy with the collaboration a job assignment was formulated and approved by the examiner and the employer. *The plan is to contribute with relevant knowledge to the development of Zoorum’s interactive services. By participating in the project and attend at weekly meetings ideas and solutions shared by developers will be taken into account for the further development of design proposals.* The following methods have been used to realize it:

- Analysis of ideas and design proposals.
- User tests.
- Evaluation.
- Specification.
- Modification.
- Presentation of design proposal.

6.1 Pre-study

In order to understand what needs existed on the market a data gathering and initial research was done by interviews and questionnaires. To make the interview sessions simple to perform and qualitative to analyze a digital survey from Google docs was used and presented on an iPad. The first phase was to ”find the pain”, in other words to understand what is the main reason people avoid to use web based discussion forums. A set of questions were asked to recall a lucid view of the needs, directed to targets with almost no experience of the subject. The users consisted of males and females from different ages.
and various ethnic groups which represents a wide population of Internet users.

Before initiating the research, Zoorum handed over the definition of three different class of users i.e. target groups that Zoorum wish to satisfy (table 6.1).

Table 6.1: Class of users

<table>
<thead>
<tr>
<th>User class</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy user</td>
<td>Classified by the membership in a forum where he or she actively engages in discussions and produces material.</td>
</tr>
<tr>
<td>Casual user</td>
<td>Attached to a forum not as a member, rather as a follower of the topic.</td>
</tr>
<tr>
<td>Q and A user</td>
<td>Have no commitment to the forum instead he or she visits the forum by chance to find answers to a specific question.</td>
</tr>
</tbody>
</table>

After being introduced to four active Internet forums which Zoorum believes are the strongest rival within the market segment, a competitors analysis was performed based on two main tasks, one expert review and one data gathering. The competitors that were analyzed represents a wide range of Internet forums covering local, national and international significant exiting competitors. The chosen Internet forums are, TheClubIsMine\(^1\), MinHemBio\(^2\), StackOverFlow\(^3\) and ForumServer.TwoPlusTwo\(^4\). These are characterized not only by their volume of users but also by their different discussion subjects and forum types. One particular Internet forum named StackOverFlow\(^5\) had a different structure considering discussions possibilities between members, it is a collaboratively edited question and answer message board were the question are categorized as keywords rather than topics. The diversity among these Internet forums leads to a comprehensive investigation on essential interactive and functional factors (table 6.2).

\(^1\)http://theclubismine.se
\(^2\)http://minhembio.com/forum
\(^3\)http://stackoverflow.com
\(^4\)http://forumserver.twoplustwo.com
\(^5\)http://stackoverflow.com
Table 6.2: The competitors.

<table>
<thead>
<tr>
<th>Internet forums</th>
<th>Discussion subjects</th>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>TheClubIsMine</td>
<td>Ice hockey</td>
<td>Threads</td>
</tr>
<tr>
<td>MinHemBio</td>
<td>Electronic equipment</td>
<td>Threads</td>
</tr>
<tr>
<td>StackOverFlow</td>
<td>Computer programming</td>
<td>Tagged questions and answers</td>
</tr>
<tr>
<td>ForumServer.TwoPlusTwo</td>
<td>Poker</td>
<td>Threads</td>
</tr>
</tbody>
</table>

The information examined for the analysis consists of an expert assessment and from users’ opinions conducted through on-line survey, posted as a thread on the selected Internet forum. A set of factors were defined to facilitate the question formulation and also to maintain a consistency throughout the different parts of the analysis. The review aimed to identify what is positive respective negative about the solutions. To understand the users and their experiences, opinions were collected from a digital survey posted in each Internet forum. The requirements for the project were stated with influence by the pre-study and opinions from stakeholders at Zoorum AB and developer from Teknikhuset AB. The pre-study resulted in a set of guidelines and a specification of required functions. A guideline is used in a process to declare what routines that should be performed to achieve a certain goal.

### 6.2 Design

The initial concept was created and presented by Zoorum AB. This idea along with the pre-study resulted in different modified concepts, low fidelity sketches and interactive mock-ups were used to visualize and communicate the ideas. To establish if the concept was feasible a real time test with the information flow from an active Internet forum was performed.

To find a suitable structure for the application a brief market analysis and literature study was performed to acquire knowledge about web navigation and create guidelines for the design proposal. The same procedure was applied to identify the advantages of social media and to define the scope of use.

One challenge was to develop a solution for the citation of posted material. To present citation after citation in the main thread currently creates absence of focus toward the overall discussion in many Internet forums. To understand the underlying factors of a discussion a real world conversation, with source
material from the talk-show Skavlan\textsuperscript{6} was mapped out and analyzed. This resulted in a set of guidelines and a suggested solution.

The prototypes used in Zoorum’s design phase were mainly interactive low-fidelity mock-ups created in Balsamiq mockups.

\section*{6.3 Evaluation}

Two focus groups with each four participators were conducted in Zoorum AB’s facilities to discuss and evaluate the prototypes. First, the agenda was presented, followed by an introduction to the subject, the purpose of the interview and the expectations on its participators. Then the participants responded to a survey with the intention to document significant background information. Thereafter pizza was served while the material for the discussion was presented. The interview session was controlled by pre-defined problem areas and direct questions. In the end the group responded to a completing survey to collect their impressions in measurable terms. The following problem areas were defined to control the interview session: \textit{initiation of a thread, the feed used to present the content, discussions, navigation and presentation, the avatar} and finally \textit{social media}.

\footnote{\textsuperscript{6}Season 2, episode 13, 11 December 2009}
Chapter 7

Result and analysis from pre-study

This chapter presents the achieved results and analysis obtained from the pre-study phase.

7.1 Market and needs

This section presents the results from the phase internally referred to as ”find the pain”, in other words to understand what is the main reason people avoid to use web based discussion forums.

7.1.1 The pain

This survey mainly focused on reasons why people do not use Internet forums actively and what features and abilities that would attract them. The results are visualized in fig 7.1, that represents the reasons why people do not use Internet forums, and fig 7.2, that represents requested features. Some significant conclusions were extracted from the comments:

• The source of the information posted on Internet forums is frequently doubted.

• An interesting subject is a vital requirement in order to attract visitors and members and high quality information seeking would be helpful.
Figure 7.1: Reasons why people do not use Internet forums

Figure 7.2: Requested features
7.2 Competitors analysis

The following conclusions and results presented in this section represents the expert assessment and the users’ opinion about the significant chosen competitors. The competitors analysis obtained by the expert assessment is summarized (table 7.1).

<table>
<thead>
<tr>
<th>Forum</th>
<th>+</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theclubismine</td>
<td>Search function</td>
<td>Visualization</td>
</tr>
<tr>
<td>Minhembio</td>
<td>Preview function</td>
<td>Navigation</td>
</tr>
<tr>
<td>Stackoverflow</td>
<td>Color-coded visualization</td>
<td>Overall picture</td>
</tr>
<tr>
<td>Twoplustwo</td>
<td>Error-handling</td>
<td>Orientation</td>
</tr>
</tbody>
</table>

7.2.1 TheClubIsMine.se

- Visualization

The Internet forum does not follow the same graphical profile as the home page, has a homogeneous design and lacks of feed-forward (possible actions does not have clear implications for the user). Poor notification when for example new messages are received and overall not intuitive.

- Navigation

Poor orientation, difficult to know where you are located, especially after sorting and filtering. Although you are located at a specific category, such as for example ”Lövensnack”, once selecting any of the filtering possibilities it will filter all of the Internet forum’s threads.

- Structures

Categorized by main and sub-categories, which then followed by the threads. ”Announcement” has higher status than other information, it is always presented at the top of the category that the user is located at and it is controlled by the Internet forums administrator. Each thread is represented by an icon, depending on the status that the thread has, it is a good attempt to provide intuitive and efficient information even though if the symbols are pretty mediocre. It was difficult to follow the development of self-produced material.

- Filtering/Sorting
The sorting function is poorly highlighted, it is placed along the bottom of the page. The hierarchy of the threads confuses the user during sorting, notices have apparently a higher priority than the other threads, very similar to the ”Announcement”.

- **Searching**
  The search is functional, you can also add more information to narrow down the search. A possible unsuccessful search results in loosing orientation which leads to recommence the search, may be perceived as frustrating.

- **Registration**
  The icon for registration is hidden and does not attract attention to the user. Error messages should be linked to the error and act ”forgiving” to more easily correct.

- **Profile features**
  Users are ranked by how active it has been, which is a great encouragement. All in all the profile attributes are informative but impersonal.

### 7.2.2 MinHemBio.com

- **Visualization**
  The graphical profile corresponds well with the home page, but the symbolic language is not intuitive. The icon that represents the forum index is too small.

- **Navigation**
  It is confusing to navigate when the functions are spread, the navigation panel of the home page offers a few features however some of them are located among the shortcut links. The interaction possibilities for navigation are not sufficiently explicit. A deficit is a shortcut link to the latest post.

- **Structures**
  A preview is available when you hold your mouse over the threads, which is great for a quick overview of the thread content. The Internet forum administrator control over the important threads and these are always placed at the top of each category. Sub-forums are available where more specific matters can be discussed, it is good for organizing the contents of each category.

- **Filtering/Sorting**
  The filtering function is not positioned advantageous, located at the bottom of the forum. A suggestion is to place the filtering at the top to get
7.2. Competitors analysis

a quick overview of the filtered material. The are few opportunities, perhaps a memory-based system which monitor read / unread topics. The sorting function is equally disadvantageous placed.

• Searching
The search form is unnecessarily difficult to find, this is because you have to go through the home page’s navigation panel.

• Registration
The registration icon is clearly visible but once entering the registration form, the graphic is perceived as unstructured. The color red may be dissuasive.

• Profile features
It is possible to develop the profile, which retain the users’ engagement. It also serves as a community where you can share other information.

7.2.3 StackOverFlow.com

• Visualization
The usage of color-coded elements that indicate whether the question is answered or not is beneficial, it contributes with effectiveness and intuitiveness.

• Navigation
It is quite easy to navigate through the minimalistic design of the home page, menu and links are not so numerous and relatively easy to find. However the elements lack of indication that they are clickable. It is clearly marked where you are located, so it is no problem to orientate.

• Structures
The simplicity is the Internet forum’s strong suit, it presents quick and straight questions and answers. Instead of categories, tags are applied, which is positive when searching. Using tags make it difficult for the user to obtain a simple overview of the content.

• Filtering/Sorting
The basic filtering function is easy to use and positioned strategically above the posts.

• Searching
The search function is simple and the tag system applies good. However, it is quite messy considering the repetitious filtering options when working with search results, it can perceives as inconsequent.
Chapter 7. Result and analysis from pre-study

- **Registration**
  The possibility to sign up with the help of existing accounts, such as Facebook or Yahoo, is an advantage. Nevertheless anonymity must be assured.

- **Profile features**
  The development opportunities are good, the list of properties that can be developed is long. It is a good method for managing members to an advantageous behavior.

### 7.2.4 Forumserver.TwoPlusTwo.com

- **Visualization**
  It lacks identity and connection to the main page, Twoplustwo. The layout is perceived as disorderly and with narrow margins between the graphical elements.

- **Navigation**
  The menu system is not optimum, it is difficult to distinguish the functions apart. The categories are located as a sidebar while the filtering, searching functions and the main menu at the top of the web page. It is quite difficult to orientate even though it is distinctive.

- **Structures**
  The material is presented as categories. It is clear, easy to understand but a lot of information. There are some redundant and confusing links, such as "First new post" which is the same link address as the thread itself.

- **Filtering/Sorting**
  The ability to sort through the superscript is positive, but there are few filtering possibilities.

- **Searching**
  The quick search function is simple and clear it also does not force the user to change views.

- **Registration**
  It consists of a standard form that could have been more graphically pleasing and encouraging for the users.

- **Profile features**
  The profile features are simple and offer a quick editing function. Development opportunities are available and your rank is based on activity level. However there are no communication between users.
7.2. Competitors analysis

7.2.5 Survey results from MinHemBio.com

Following results were collected from digital surveys posted on MinHemBio.com. The surveys were designed not only to cover the defined user classes but also to collect both quantitative and qualitative data, since the survey offered the users to add numeric and subjective data. The survey focused on the following subjects: graphics, navigation, presentation and profile features. The tables present the qualitative data while the figures visualize the quantitative data.

Graphics

The respondents were asked to answer questions related to the graphical elements found on the selected Internet forum.

Table 7.2: User comments about the graphics

<table>
<thead>
<tr>
<th>Casual user</th>
<th>Heavy user</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither good nor bad, fulfills its function.</td>
<td>Simple and clear without annoying extravagance.</td>
</tr>
<tr>
<td>The graphics should be updated following Web 2.0 but it should not be exaggerated.</td>
<td>Easily overview, calm and good for the eye.</td>
</tr>
</tbody>
</table>

The respondents made their decisions on a five-point scale, ranging from bad to good (1 equals bad and 5 equals good).

Figure 7.3: User opinions about the graphics
Navigation

The respondents were asked to answer questions related to the navigational components found on the selected Internet forum.

Table 7.3: User comments about the navigation

<table>
<thead>
<tr>
<th>Casual user</th>
<th>Heavy user</th>
</tr>
</thead>
<tbody>
<tr>
<td>I do not always find it easy to navigate, especially the larger threads.</td>
<td>Difficult to monitor threads. Want to control everything within the forum, to see what threads I monitor and where there has been activity in them. Preferably collected on the start page.</td>
</tr>
<tr>
<td>Better than in many other forums, but it can definitely improve. Just take the example that many people start threads about the same things, with better/clearer navigation/functionality this had never happened.</td>
<td>Awesome and easy to search, extremely well-functioning site.</td>
</tr>
</tbody>
</table>

The respondents made their decisions on a five-point scale, ranging from bad to good (1 equals bad and 5 equals good).

Figure 7.4: User opinions about the navigation

(a) Casual User  (b) Heavy user  (c) Q and A user
7.2. Competitors analysis

Presentation

The respondents were asked to answer questions related to the information architecture (i.e. the way components fit together) found on the selected Internet forum.

Table 7.4: User comments about the presentation

<table>
<thead>
<tr>
<th>Casual user</th>
<th>Heavy user</th>
</tr>
</thead>
<tbody>
<tr>
<td>A bit &quot;old fashioned&quot; and not perspicuous.</td>
<td>Smooth and easy.</td>
</tr>
</tbody>
</table>

The respondents made their decisions on a five-point scale, ranging from bad to good (1 equals bad and 5 equals good).

Figure 7.5: User opinions about the presentation
Profile features

The respondents were asked to answer questions related to the profile characteristic found on the selected Internet forum.

Table 7.5: User comments about the profile features

<table>
<thead>
<tr>
<th>Casual user</th>
<th>Heavy user</th>
</tr>
</thead>
<tbody>
<tr>
<td>You can set up most of what you want, but the page is messy.</td>
<td>Do not use it, not interesting.</td>
</tr>
</tbody>
</table>

The respondents made their decisions on a five-point scale, ranging from bad to good (1 equals bad and 5 equals good).

7.3 General guidelines for Internet forums

The following guidelines are based on the market analysis, the competitors analysis and a literature study. The aim is to guide the design in a preferable direction and motivate beneficial goals.

- Use clear and unambiguous graphics that represents the general profile.
- Avoid homogeneous material.
- Feed forward supports intuitive interaction.
- Use real time feedback to forgive the users.
Symbols and colors should follow the functions.

A feed or some kind of real time updates preserves the users’ attention.

Sorting and filtering should be placed strategically in the layout, static or in the top.

Make it easy to understand the orientation.

Using personal profiles will encourage the development and engagement among members.

Implement a system that encourages good behavior among the writers.

Emphasize a trustworthy impression of the material produced.

Create focus on the threads.

Categories are suitable for a general view of the content.

Tag system facilitates search function and allows more complex relations between posts.

Use connections to social media for promotion and wider use of the content.

7.4 Functions

A set of required functions were acquired from the pre-study to fulfill the expected needs.

Real time feed with posts from the forum

Mobile application

Filtering feature based on following categories

- Friends
- Subscriptions
- Top threads
- New posts
- Tags

Drop down menus

- Messages
- Profile

Extensions
• Plug-ins
• Stickies
• Themes

• Democratic system

• Tags
  • Geographic
  • Subject
  • Users

• Preview of posts

• Toolbar
  • Live chat
  • Like on Facebook
  • Share
  • Make a tweet
  • Facebook feed
  • Twitter feed
  • Online users
  • Library
  • Intensity
  • Top charts

• Rewards for threads
  • Thread of the week
  • More than 100 posts
  • Active more than 10 weeks
  • Most commented
  • Etc.
Chapter 8

Result and analysis from design

This chapter presents the achieved results and analysis obtained from the design phase.

8.1 Concept

The main idea that Zoorum’s concept is based upon is to function as a platform for modern and usable web based discussions. Anyone with Internet connection should through a simple process be able to create their own Zoorum web page and gain revenue from advertising. To differentiate itself from traditional forums Zoorum will present material in a feed to make the users aware of activities in real time. A filter will make the content easy to browse by tags or categories.

8.1.1 Guidelines for designing web navigation

Web navigation is one of the most essential subjects when designing a usable Internet forum. The following guidelines are based on the pre-study, trends on Internet and a literature study.

- Consider the four Q’s: where am I, where have I been, where am I going, why am I going there?
- Categories are core elements of the web sites navigation.
- Categorization should contain few headlines to simplify the view.
- Redundancy of links increases the risk for the user to ignore most of them.
- Tags are complements to categories with different purpose.
• Content is king: social media should encourage the users to produce material and focus on how to emphasize it.

• Elements for navigation should have the same appearance where ever the user is located.

• Create a context to the user’s location.

• Consider the user’s mental model.

8.1.2 Proposal for a navigation system in Zoorum

The attempt was to develop a system, with respect to the pre-study and guidelines for navigation, that creates a lucid view of the content but at the same time can use the advantages of tagging.

The suggested solution is to use predetermined tags that can classify a post and use it for browsing along with user generated tags to mark up a post and optimize its search-ability. The predetermined tags are called high-level tags and contributes with a general view of the subjects in the forum. The user generated tags are called low-level tags and contributes with a specific and detailed label for each post. They can be visualized in a cloud or a list controlled by the high-level tags.

8.1.3 Prototypes

Following mock-ups illustrate a proposal for navigation in Zoorum, the high-level tags are described in 8.1a and 8.1b. Additional functionality to the high-level tags are described in 8.1c and 8.1d.
(a) The forum’s start page consists of a feed where up-to-date posts are presented. In the left column tags control the content, or more specifically activate and deactivate keywords.

(b) The keyword named "Tv-apparater" is activated and the content is presented consequently.

Figure 8.1: Navigation
(c) Online members that activated the same tag can be visualized to each other in the toolbar.

(d) Multimedia posted under the activated keyword is visualized in the toolbar.

Figure 8.1: Navigation
8.2 Internet forum conversations

One of the main features in an Internet forum is to maintain conversations. The most intuitive solution is to mimic a realistic conversation.

8.2.1 Guidelines for Internet forum conversations

The following guidelines are based on Internet trends, an analysis of a realistic conversation and a literature study.

- Emotional expressions are important components of a discussion to complement verbal communication.

- Consider that, in contrast to real time discussions posts on Internet forums are not usually cited chronologically.

- Citation should contribute with context, so the users can understand the response.

- Redundant citations reduce the focus on the main subject in the thread.

- Solely one level of citation should be visualized in the initial view of a thread.

- The history of citations should be arranged due to their relations and be expandable.

- Aim for simplicity in the presentation of their relations so focus is maintained on the content.

8.2.2 Proposal for the design of Internet forum conversations

The suggested system to keep track of the history among citations is to refer every citation to its source and every source to its citation. The citations will function as an expandable sub thread about a specific post in the main thread but will also be real time presented in the feed. The solution makes it easy to follow a discussion with focus on the main response.

8.2.3 Prototypes

Following mock-ups illustrate a proposal for citations in Zoorum. The initial conversation is illustrated in 8.2e, the solution for citation is described in 8.2f and 8.2g. The citation history of a member is described in 8.2h.
(e) The start page of the Internet forum

(f) Sven cited a post from Janne. The sources can be expanded above the post and the citations beneath the post

Figure 8.2: Conversation
8.2. Internet forum conversations

(g) Jorge cited Sven’s post

(h) The sources to Jorge’s citation is expanded

Figure 8.2: Conversation
8.3 Social media

8.3.1 Guidelines for social media

Social media is an important aspect to consider and desirable to integrate in modern web solutions because it supports engagement and promotes the service. The following guidelines are based on the pre-study, Internet trends and a literature study

- Use social media to enable news and updates about the web site to create a feed for marketing.
- Make material sharable to social media applications.
- Automatize sharing of posts.
- Use social buttons to make it easy to follow the web site and to communicate with users in long-term.
- Social bookmarks and tags can be used to label and spread the content.
- Present social activities and social material about the web site.
- Embed external media content to maintain the users’ attention.
- Develop an facebook application.

8.3.2 Proposal for the use of social media in Zoorum

As a suggestion a toolbar with social features can be connected to the users’ location in Zoorum along with social buttons integrated in the individual posts. The toolbar can appear discrete and supply the most useful functions without interfere with the users’ attention to the Internet forum. Each individual post can be shared and embedded in social feeds. Additionally the users can express emotions about the posts through so called stickers.
8.3.3 Suggested functions for a social toolbar

The functions are found in the toolbar at the bottom of the Internet forum and illustrated in 8.3i.

- Online users (A)
- Share a link from Zoorum to social media (B)
- Media library (C)
- Make a tweet about Zoorum on twitter
- Intensity of the users’ activity (D)
- Like Zoorum on Facebook (E)
- A Facebook feed (F)
- A Twitter feed (G)
- Facebook activities (F)
- Twitter activities (G)
- Live chat (H)
- Top charts with users, posts and threads

8.3.4 Prototypes

Following mock-ups illustrate a proposal for the use of social media in Zoorum. The share feature is described in 8.3m, how to share a post on Twitter is described in 8.3k and 8.3l. Recent and popular activities from the Internet forum Facebook page is described in 8.3m and 8.3n.
(i) The Internet forum's start page

(j) The share feature is activated in the social toolbar

Figure 8.3: Social media
(k) The marked post can now be shared on the micro blogging service Twitter as a direct link

(l) The link is posted in the user’s Twitter feed

Figure 8.3: Social media
(m) In the social toolbar recent activities from the Internet forums’ Facebook page is accessible

(n) In the social toolbar popular objects shared on Facebook is accessible

Figure 8.3: Social media
8.4. Proposal for embedded media

Another important aspect is to support the integration of external media into the forum’s feed. Four important kind of media was identified:

- Video, e.g. Youtube, Daily motion and Metacafe.
- Image, e.g. Flickr, Picasa and Photobucket.
- Audio, e.g. Pandora radio, Spotify, Last.fm.
- Web posts e.g. Blogs, news and magazines.

The suggestion is based on two alternatives to embed content when creating a post in the forum. The first solution is automated through the use of a share button from Zoorum, available in the external media post. This requires that the media platform supports Zoorum’s application. The second solution is to manually embed the content in the post by inserting the link. Users can select to publish the content either as the first post in a new thread or within an existing thread as a reply.
8.4.1 Prototypes

Following mock-ups illustrate a proposal for embedded media in Zoorum. The process of sharing an image from Flickr as a new post in Zoorum is described between 8.3p and 8.3t. How the post is presented in the Internet forum’s feed and in the thread view is illustrated in 8.3u and 8.3v. Sharing a link from YouTube into an existing thread is described between 8.3w and 8.3y.

Figure 8.3: Embedded media
8.4. Proposal for embedded media

(q) An image is marked and a share feature to the Zoorum platform is available

(r) Login is required to enable forums connected to the user’s membership

Figure 8.3: Embedded media
(s) The link can be posted as a new post and will automatically generate a new thread, or it can be posted within an existing thread.

(t) The link is posted as a new thread in the category "Tv-apparater"

Figure 8.3: Embedded media
8.4. Proposal for embedded media

(u) An embedded version of the link is presented in the Internet forum’s feed

(v) The new thread is presented in the thread view

Figure 8.3: Embedded media
(w) A link from YouTube is shared within an existing thread

(x) Auto-complete supports the user’s selection of a thread

Figure 8.3: Embedded media
The link is posted in the thread "Musik videos"

Figure 8.3: Embedded media
Chapter 9

Evaluation

This chapter presents the achieved results obtained from the evaluation phase.

9.1 Focus groups

9.1.1 Positive response

- The feed conduces current activities, alive discussions and spontaneous products.
- The tag system is usable.
- Connections to social media are appreciated because it will attract people from the users’ personal network to the discussion.
- The possibility to embed media in the posts is usable.
- The filter system is essential to browse the content.
- A library with suggested key words for the tag system and auto-complete to insert them is helpful.

9.1.2 Negative response

- The structure was sometimes perceived messy.
- There were suspicions about the threads attendance in the feed since they might fall out.
- The predetermined avatars were considered impersonal and a limitation to the creation of a unique identity.

Other problems
• Possibilities for the creator of the forum to control some options, for example anonymity, was suggested.

• The forum might be exposed to abuse of tags and spam.

• How can the creditability of the content be judged?

9.1.3 Response from the completing interview

Overall impression

The overall impression from the group is positive and the concept raises some kind of curiosity among them. Tags, the feed and social multimedia sharing was the most appreciated ideas but the structure and lifetime of the threads were doubted.

![Figure 9.1: Overall impression](image)

Important features

![Figure 9.2: Important features](image)
The navigation

Comments about the navigation and specifically the tag system were positive.

![Figure 9.3: The navigation](image)

9.1.4 The initiation of a thread

The solution to create a new thread was overall experienced very simple and easy to use.

![Figure 9.4: The initiation of a thread](image)

The feed for presentation

The response indicates that the feed was considered fun and easy to use for real time updates within the Internet forum.
The avatars

The opinions about the avatars were divided, but most comments implies that preferably real world photos at least should be able to use as an alternative.
Chapter 10

Discussion

Working process

The main challenge of the project with Zoorum was to manage the design process. The work flow was mostly continuous with few distractions and the process advanced according to the initial schedule in the business plan. The design team consisted of only a small number of members and the weekly assignments were well defined, which might be a reason to the low frequency of management related problems.

Goals

- **Understand the needs from the market segment**
  Knowledge about the users’ needs was obtained early in the process and used to create requirements and guidelines for subsequent development.

- **Meet the requirements from the stakeholders**
  Initially the requirements from the stakeholders were few and we were encouraged to: meet the assignments with an open mind and to generate innovative solutions.

- **Take advantage of the latest generation Internet applications**
  One of the essential issues during the project was to analyze the competition and identify Internet trends so we could apply them in our design process.

- **Design a solution that is considered to be usable**
  The design suggestions we presented was corresponding to the requirements we stated, but they were limited to a conceptual level which made it difficult to evaluate them from a usability perspective.

- **Visualize the solution in shape of prototypes**
  The majority of the design suggestions were visualized as mock-ups. Since our practical work was concentrated to the early phase of the design process the level of details and interaction was low.
• **Evaluate the solution** The evaluation could have been extended, especially later in the process, but during the circumstances it was performed according to the expectations. The focus group and the survey gave some interesting indications that was useful to consider.

**Challenges and limitations**

One of the greatest challenges was to identify the core problem of existing Internet forums and understand main reason why certain people do not use them. The lack of resources caused some limitations in the data gathering phase since we couldn’t reach a wider population. The tempo during the design phase was low due to the financial focus and lack of co-workers. Another drawback was that we had to make an abrupt in the design process when our practical part of the thesis came to an end. A further and continuous collaboration would lead to a more consistent result.

**Improvements and future work**

The quantity of participants and the variation of target groups could be higher to get a more confident result in the requirement phase. Considering the proposals presented in the thesis project as conceptual solutions, future developers must continue to conduct further and more detailed evaluations of the user experience and interaction. Due to the abrupt conclusion of the thesis project, there are still some essential steps for ensuring the goal of designing a usable Internet forum. It is also important for the developers not to underestimate up-to-date features from the Internet i.e. the latest or newest trends circulating on the Internet, specially since social media and the Web 2.0 has a big impact on user experience.
Chapter 11

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Appendix A

Interview for market and needs

- Do you use Internet forums regularly?
- Does any of these reasons affect your use of Internet forums?
  - Do not know how it works
  - Lacks knowledge
  - Do not have any need
  - The design is unattractive
  - I have a bad image of the users
- Comments to previous question?
- Is there any other reason you would not visit an Internet forum regularly?
- What would make you visit an Internet forum?
- What kind of functions would you like to experience in an Internet forum?
  - Connection to social media
  - Mobile application
  - Video response
  - Live chat
  - Post extension (plug-in)
- Do you prefer anonymous or personal profiles?
- Do you wanna use your Facebook ID to sign in?
Appendix B

Questionnaire for competitors analysis

- Do you visit the Internet forum regularly?
  - No
  - Daily
  - Weekly
  - Monthly or less

- How did you get in contact with the Internet forum?
  - From search engine
  - From personal contacts
  - From social media
  - Other

- What is your overall perception of the Internet forum, scale from 1 to 5?

- What do you think about the graphics, scale from 1 to 5?
  - Comments to the question above?

- What do you think about the navigation, scale from 1 to 5?
  - Comments to the question above?

- What do you think about the presentation, scale from 1 to 5?
  - Comments to the question above?

- What do you think about the profiles, scale from 1 to 5?
• Comments to the question above?
• How would you like improve the Internet forum?
• Do you miss anything specific on the Internet forum?
Appendix C

Background interview for focus groups

- Your reference?
- Gender?
- Age?
- How often do you visit an Internet forum?
  - Never
  - Daily
  - Weekly
  - Monthly or less
- How do you get in contact with an Internet forum?
  - From search engine
  - From personal contacts
  - From social media
  - Other
- In what purpose do you visit an Internet forum?
- Do you visit the Internet forum regularly?
  - Searching for solutions
  - To observe specific subjects of interest
  - To produce content
  - Other
- Are you missing anything in the Internet forums you visited so far?
Appendix D

Completing interview to the focus groups

• Your reference?
• What is your over all impression of Zoorum, scale 1 to 5?
  • Comments to the question above?
• What did you appreciate most with Zoorum’s concept?
• What did you dislike most with Zoorums’s concept?
• What features do you consider important in an Internet forum
  • Graphics
  • Usability
  • Presentation
  • Navigation
  • Social media
  • Mobile application
  • Media sharing
  • Personal profiles
• What do you think about the navigation, scale 1 to 5?
  • Comments to the question above?
• What do you think about the solutions to create threads?, scale 1 to 5?
  • Comments to the question above?
• What do you think about the idea to present activities in the feed, scale 1 to 5?
  • Comments to the question above?

• What do you think about representing yourself with an avatar, scale 1 to 5?
  • Comments to the question above?
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