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Web 2.0 as organizational user-centered support

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ABSTRACT

The Internet today is used as a platform to communicate and many new areas are yet to be explored. Web 2.0 is one of the new areas, which provide new ways for people to communicate. Organizations are exploring this area and trying to use its benefits to give communication and cooperation within organizations an even greater value. The telephone support in large companies is often expensive and at the same time there are a lot of problems that the user could solve them selves, if they were able to find the right information. If this could be done organizations would save money and also make sure that the knowledge the users have doesn't go to waste. The purpose of this thesis's to provide our company with new ideas that could be useful for them when developing a user-centered support system with web 2.0 as platform. Analyze the benefits and disadvantages regarding web 2.0 applications and some functionality that needs to be taken into consideration in an organizational support system and to discuss an appropriate solution. The focus was on three areas in web 2.0 which are blogs, wikis and discussion forums. Different kind of methods like web development and gathering methods has been used. Our supervisor helped us in choosing the respondents that was most suitable for our research. Popular web 2.0 web pages provided us with new ideas in layout and functionality. All of the information would later on lead to a support page, which is combined; by a wiki and a discussion forum because of the advantages they together can provide a user. The layout solution will be presented as a low fidelity prototype in the conclusion chapter. We do feel that if web 2.0 is used in the right way it will be useful in organizational support and we do believe that organizations will implement this in the near future.

This report is written in English.

Keywords: Web 2.0, User-centered support share, Communication

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1. INTRODUCTION

This introductory chapter describes the background and the problem definition of the thesis. Furthermore the purpose, delimitations, a brief description of Volvo IT and the structure of the report will be given.

1.1 Background

Today are many users connected to organizations around the world through Internet both internally and externally. The Internet has given many new opportunities to atomize certain tasks to reduce cost and has altered the way to communicate like chat, e-mails, Skype calls, online videoconference and many other channels. Social network will allow the users to collaborate with each other on another level; this will add an even greater value to the intranet. The usage of Internet applications is becoming more dynamic and user-centered. Large international organizations always have a support system to help the end-user via a helpdesk in a specific matter regarding technical support. Making phone calls has become cheaper by the years but still do the international calls cost a lot of money for the organizations. Helpdesk support is a vital part of an organizations well being and at the same time the employees have a lot of knowledge on different areas, this means that social networking through web 2.0 hopefully could be used to spread knowledge amongst the users and create a support-user-network.

Web 2.0 is a trend in the use of World Wide Web technology that aims to facilitate creativity, information sharing, and, most notably, collaboration among users. These concepts have led to the development and evolution of web-based communities and hosted services, such as social-networking sites, wikis discussion forums and blogs (Michelson 2006). Web 2.0 is now an acceptable way of referring to the second-generation web, that enhances the collaboration and sharing via social networking sites. Organizations are at a stage were they are feeling that they could improve on this particular area and hopefully manage to use some of the aspects that the web 2.0 brings. By letting the users help each other they can decrease the telephone support cost and looking at it at a global perspective it will be a relatively easy and efficient way to lower costs. It’s a new area that has flourished around the world and the social web usage is now a target for user-centered support at organizations, and the web 2.0 is a rather unexplored area when speaking of web applications for organizational benefits and competitive advantages.

1.2 Problem definition

International organizations need to reduce the international phone calls to their support services. The main goals will be to give them another way to support themselves through a web 2.0 support site. This will lead the users to finding solutions on the intranet, instead of calling the phone support. Finding the appropriate web 2.0 solutions is one of the problems in regard on looking on aspects about human cognition, usability and to create a user-friendly environment via web 2.0. This can be done in many different areas as web 2.0 take on many forms.

The main question to address:

- *What different type of web 2.0 applications is preferred to use in a user-centered support system for an organization?*

1.3 Purpose

The purpose of this thesis is to carry out our bachelor thesis for the It-university in Gothenburg and supply our supervisor and his associates with new ideas that could be useful for them when developing a user-centered support system with web 2.0 as platform. Also to analyze the benefits and disadvantages regarding web 2.0 as an organizational support system and to discuss an appropriate solution that will be presented as a low fidelity prototype. Some common problems in organizational web forums like functionality and what content that needs to be show will also be analyzed. Hopefully the solution will be able to work as a compliment to the existing support systems today to cut down unnecessary phone calls to the support and provide useful information regarding web 2.0 as well.

1.4 Study case: Volvo IT

Our study will be done at Volvo IT in Arendal (Gothenburg, Sweden). Volvo IT is a global company and part of the Volvo Group. "Our experienced and motivated team delivers reliable industrial IT solutions, competitive telematics solutions and insightful consulting services. Volvo Information Technology AB is a wholly owned subsidiary of AB Volvo. Clients include the Volvo Group, Ford-owned Volvo Car Corporation, and other major industrial companies. Volvo IT provides solutions for all areas of the industrial process, and offers unique skills and expertise in Product Lifecycle Management, SAP solutions, and IT operations. Volvo Information Technology AB is a wholly owned subsidiary of AB Volvo" (Volvo IT, 2008).

Only a brief description of the supporting areas will be given: Volvo Action Service is an organization hosted within Volvo Parts three logistic divisions (European, North America and International). Volvo Action Service is also the brand name of the break down support service provided to Volvo Trucks and Volvo Buses. Included in the maintenance responsibilities are the following applications. Dealer Business Support (DBS) is a support organization developed to help Volvo-group dealers and workshops to maximize the benefits of applications and systems delivered by Volvo IT (Volvo IT, 2008). The support structure for Volvo is three levels of support which begins with the helpdesk support. The users first call the first line support and if the problems are more complex the question or problem will go further on to second and third line.

1.5 Problem approach and delimitations

Our main focus will be on analyzing the different ways that web 2.0 could work as a support web tool for the users at Volvo and if it's suited as a support channel as well. Although there are many issues to address, our goal is to provide Volvo IT with an additional solution with web 2.0. We will give alternative ideas of functionality and layout design for Robert Brasegård and his associates and not put to much time on the problems that will arise with the different styles because of the time limit. We also visited Volvos support department in Gothenburg, as we got the information we needed from them about Volvos support system and routines. With their knowledge we will obtain our key information that is vital for our website. We also looked into the content and functions, which was brought up by our supervisor Robert Brasegård and the respondents we interviewed.

1.6 Structure of the thesis

The Methodology chapter presents the scientific standpoint of the study and the process of work. This chapter describes the nature of how data was collected. Theoretical Framework chapter will present related information about social network, web development and web 2.0 and other related topics. The result chapter will show the results of the gathered information in a table summarization and the answers for the respondents as well. The chapter discussion and conclusion will contain thoughts about different aspects and the conclusion of the results. A low fidelity prototype will visualize the layout and the functions will be explained.

2. METHODOLOGY

This chapter describes the nature of the methods used, the realization, and how data was collected. Finally validity and reliability with the study is discussed.

2.1Choice of methods

According to Jennifer Preece (2002) the purpose of data gathering is to collect sufficient, appropriate and relevant data so that a set of stable requirements can be produced. This data will help us set the requirements on our system. There are essentially a number of basic techniques to use for data collection, but they are flexible in their way. It is not easy to say which technique is the most appropriate, it depends on which one we think will give us the best answers to our questions in the time limit and the task at hand (Patel & Davidson 2003). The web 2.0 phenomenon is a rather unexplored area, which means that the research will have an exploring characteristic from our point of view.

Developing a web site highly requires these aspects they mention in Interaction Designing beyond human computer interaction. The interaction-user approach with object oriented analysis design approach, which includes four main activities: Analysis of the problem area, Analysis of the user area, Architecture design and component design (Mathiassen et.al). These two overall methods combined gives us an insight in the problem and the user area and at the same time the computer interaction method will provide good support and input for understanding in developing a mockup of a user friendly support web site. The underlying information gathering techniques that have been used are interviews, collection of scientific work via Internet or literature, observations and metaphors of popular webs sites. Olson and Moran (1996) suggest that choosing between data-gathering techniques rest on two issues: the nature of the data gathering technique itself and the task to be studied. Qualitative were preferred over quantitative because at the early stage of information gathering was interviews best suited and this approach get mostly qualitative data (Preece 2002). Because of the time limit and the unfulfilling quantities of data that a questioner produces it had to be excluded from this project. The gathering techniques will be divided into primary and secondary sources.

The methods we have choose to gather our information will be interviews with respondents inside the IT-business and an observation that will include analysis of web 2.0, contents and functions but also information about the Volvo helpdesk and their Intranet.

2.2 Interview

The structure of the interviews was done after the so-called "funnel-technique". This means that it starts with overall questions and further on become more detailed in the same area (Patel and Davidson 2003). At the beginning the gathering of information with the new environment creates a lot of data to be considered and analyzed, which also brought up new exclamations. The experts were of great help at an early stage when much of the uncertainty was explained. The main time frame was about one hour per interview and it was separated into fifteen minutes of introduction and overall questions and had the resting time for deeper digging questions. The type of information gathered depends on the interviewee's competence of the problem area, this means that it has been from either a design or functional angle. The most appropriate approach to interviewing depends on the goals, the questions to be addressed, and the paradigm adopted (Preece 2002). It was not only strictly face-to-face interview because one of the contacts were in Poland, which only made it possible to manage the interview over the internet via net meeting which is a windows application for net conversations. In making these calls it was more important to get the questions correct, so the respondent could understand the question without further explanation like writing on paper or whiteboard etc. It will be important when developing interview questions, to keep them short, straightforward and also avoid asking too many questions (Preece 2002).

2.2.1 Selection of respondents

The chosen respondents were people that had at least some knowledge about support, functionality or web 2.0. Our supervisor arranged a meeting with Gregorez and Mats Carbin but we contacted the rest of the respondents and they all had knowledge about support issues in some way. The respondents were five persons that had diverse professions in the IT industry. There were one respondent from the company HP and the rest were within Volvo IT. The age of the respondents were left out, because it did not feel necessary in our research.

Respondent 1

Mats Cabin is a VOSP/CQ application administrator who had knowledge about application issues, and also informed us with information about the Volvo support. He has been working in Volvo IT for a couple of years.

Respondent 2

Gregory Lozinski a consultant from Poland working on a forum prototype had some input on design and functionality issues. He gave us guidelines in what we should prioritize when developing the support site and he showed his prototype.

Respondent 3

Magnus Scharlin works as a support manager that has worked with support for many years at Hewlett Packard gave his view on support and atomization via web. He gave some pointers about the functionality and had input on support atomization and support management in general.

Respondent 4

Dan Elfstrand is a Helpdesk support manager for Volvo IT provided us with information about different support issues, functionality and spoke about how the support was linked together.

Respondent 5

Jonny Welander works with helpdesk support and application support. He had worked there for almost 2 years. He gave his opinion on the current system and what he thought about web 2.0 as a support system.

2.3 Observation

There are a lot of ways to gather information and according to Jarl Backman (1998) if you want to know anything about the reality, you need to analyze it. One good technique to use to analyze peoples behavior, things that happen in natural situations and get to know the area they work in is observation. Observation involves watching and listening to users. The observation method is also independent of people's willingness to give out information. Using this method takes a lot of effort, because it is a time consuming method (Patel and Davidson 2003). To be able to develop a support site an observation of the Volvo intranet had to be done and an observation of the Volvo helpdesk support in Gothenburg. This were the two areas that was the closest to the support site we wanted to built and it would provide us with a lot of information that could be useful to support our users in a good way if our observation would be successful. To reach another greater level of validity we went to HP and observed their Helpdesks in a similar way. One-way to observe is the "Quick and dirty" observation which can occur anywhere, anytime. This is ways to finding out what is happening quickly and with little formality (Preece 2002). This is a perfect way for us to quickly get valid information and could be excellent in our case to get hold of the situation as fast as possible. Another useful approach was the "Observation in field studies" which came to hand at the helpdesk to observe how the workers at the helpdesk were working and the tools they used to get the job done. All of the observations where registered by writing down everything with paper and pen so afterwards it could be studied and discussed.

2.3.1 Analysis of web 2.0, contents and functions

Our supervisor wanted us to analyze wikis, blogs and discussion forums. When creating a website it will of course include contents and functions, which needed to be taken in consideration on the website. Because of the wide range of content and functionality issues that could be discussed when creating a website, we only looked into a few areas within these boundaries. Our supervisor said that the following areas of functionality and content like language, admin, rating, user information and messages was appropriate to analyze.

Using metaphors is a good way of getting ideas as well for finding similarities in the use of functionality. Many popular sites have been analyzed from both these aspects to gather the best of different worlds, to give influences of different interfaces. A conceptual model is in terms of interface metaphors, by this is meant a conceptual model has been developed to be similar in some way to aspects of a physical entity (or entities) but still has its own behavior and properties (Preece 2002). Using common actions that invites the user to work with the system has always been a winning concept, providing users with a familiar circumstance helps users to understand, learn and remember how to perform certain actions (Preece 2002). The balance is to use existing working interfaces and functions and combine them with new ideas and not to become narrow thinking and lose creative thoughts. When developing web sites it's a good idea to get influences from different websites, to use the different parts you consider are the best for you purpose. A look at a couple of the most successful sites like YouTube, Facebook and many others will be analyzed and work as influences for the prototype. A look at RSS was done and the concept was later used in our solution. It will be a low fidelity prototype that only will visualize the web design with the related content but without the functionality. It is setup of different screenshots that will display the different pages of the site that will be encountered when using the support site.

2.4 Course of action

The information gathering was divided into two main areas, the web analysis that was our own research on web 2.0 sites, functionality, content on web 2.0 applications and support information. Both of these areas provided us with information that would be useful in building our prototype and discussing advantages and disadvantages between the web applications.

The project started at our work location because people had diverse knowledge about application support, system development, programming etc. As we didn't really know in which end to begin, our supervisor gave us some early guidelines in which persons we should contact and he booked our first meeting with Mats Carbin and also said that we should try booking a meeting with the support.

The research began at Volvo IT with interviewing Mats Carbin and speaking to our supervisor about the support situation at Volvo. When interviewing Mats we had a semi-structured interview were we wanted his opinion on how the support worked, which took about 45 minutes. We had a couple of random meetings with our supervisor who spoke about his opinion on the current support and his own visions on how web 2.0 could add value to the support, as well as providing additional help to the research.

At a late stage in our research we went to the helpdesk for an interview with Dan Elfstrand and observation on the different support systems that are currently in use. The purpose was to gather information about the functionality and what kind of key information we could consider when making our prototype. We began with the interview with Dan Elfstrand who spoke about the current support communication and what the different supports around Volvo took care of. The observation took place with Jonny Welander were we took notes on the current support systems that might be useful for us when designing the prototype. He was asked about his work and what he thought could be of use in a web 2.0 support. He also gave us some information regarding language, search functionality, admin and his opinion on the current support systems usability.

With Grezgorz over in Poland we had to connect through netmeeting, which is a program in windows that handles voice communication over the Internet. Because we didn't know anything about Grezgorzs knowledge in web 2.0, support or web development, it was most appropriate to choose an open and unstructured discussion. The information he provided was about the functionality and what kind of web 2.0 application he thought should be used in their support site.

We went to HP office in Gothenburg to speak to Magnus Scharin who is the project support manager, who had knowledge about the functionality of support routines. We asked Magnus about HPs support on how it is built up and how it works overall to get a greater understanding in their line of support. We also asked questions about his work and about what the users wanted to alter the value of support-ability.

Our analysis of the web 2.0 applications started a few weeks into the project and was studied via the internet. We searched on the most popular web 2.0 websites and looked at the advantages and disadvantages and at a deeper level on Wikis, blogs and discussion forums. Later on we gathered all our information to se what could be used in our case and what kind of information that would not be useful for us.

2.5 Data analysis

The data analysis was divided into the interview interpretations and the analysis the web 2.0 applications combined with functionality and content.

The interpretation of the recorded interviews was done several times to get the correct information about the respondent's opinions in the different research areas, especially about the persons who had knowledge about content and functionality. A lot of the information was indirect to the work so only the information we felt was necessary was mentioned as a short summarization.

The web application analysis began with structuring the gathered information into tables and we decided that wiki should be compared against discussion forums and blogs combined. This was appropriate because wiki had a more distinct way of producing and handle information and both discussion forums and blogs was more similar in their way of use. The advantages and disadvantages of the applications were discussed from our own opinion and knowledge that we gathered through websites.

2.6 Information sources

The data collection is divided into two parts, the primary sources which gave direct knowledge to our work and the secondary was mostly about getting a better understanding of support systems and other person's knowledge about support problems and functionality input. Primary sources gave direct knowledge of the problem area and introduced us to the new environment at Volvo. This also included the overall details about Volvo support and routines that were highly relevant. Our primary sources of help and information were our supervisor Robert Brasegård, which has provided us with contacts that could be of use in our work. Volvo IT department in Gothenburg that we visited was one of the most useful information resources in our project as they were the ones with all input on the key aspects that we had to take in consideration when making our layout.

Secondary sources was used for an extra input and influences in different areas like the discussion forum prototype from Poland, the visit at Hewlett Packard support for and better understanding in their knowledge on support systems.

2.7 Sources of error

Duo to the uncertainties of the expert's knowledge about the problem area made the interviews carry out in a general approach. This caused that some irrelevant questions that were brought up couldn't be answered. At the beginning the authors lacked knowledge of the problem situation, which made that some relevant questions may have been left out. The goal was to reach as high validity and reliability as possible. Validity is in which extent you measure what you have attended to measure. High validity in the data collection means that a foundation for a reliable interpretation has been achieved (Patel and Johansson 2003). Reliability means the grade of reliability in the measure instrument meaning in

which extent you get the same value if you do the search all over again. Interviews were made with respondents who had much experience in support issues, which made the answers reliable.

3. THEORETICAL FRAMEWORK

The theoretical framework will provide greater knowledge about the problem environment and describe the different areas that will be included in the analysis. Terms like web 2.0 and different web development aspects will be mentioned as well.

3.1 Web 2.0

Within 15 years the Web has grown from a group work tool for scientists at CERN into a global information space with more than a billion users. Currently, it is both returning to its roots as a read/write tool and also entering a new, more social and participatory phase. These trends have led to a feeling that the Web is entering a second phase, a new improved Web version 2.0 (O'Reilley 2004). The term became known after the O'Reilly web media conference in 2004. Web 2.0 is more user-centered then the regular web usage. Users can now interact and make changes to some extent, which creates a more dynamic usage than ever before. With active users and the possibilities to use the information in other contexts is one of the reasons of its success according to Stefan Hamilton (2008). Many people feel like the "dotcom" era was the turning point for the web where it left its old web 1.0 state and became 2.0 instead (O'Reilley 2004). People have different thoughts about the new term and it's yet not been official. But there's still a huge amount of disagreement about just what Web 2.0 means, with some people decrying it as a meaningless marketing buzzword, and others accepting it as the new conventional wisdom (O'Reilley 2004). The key to competitive advantage in Internet applications is the extent to which users add their own data to that which you provide.

Web 2.0 can also be described as an emerging business and technology developments that utilize the Web as a platform and defines how the Web will drive business in the future. What began as a focused gathering on the implications of the Web becoming a platform has transformed into an industry event focused on the Internet innovations, service, applications, businesses and models that are changing the way companies do business and how people live (Web 2.0 summit 2007).

3.2 Web 2.0 applications

Web 2.0 applications are all about sharing either if it's video, pictures, music, text messages or any other form of media or communication trough a web platform. But because it is an undefined term, a lot of people have different opinions on what web 2.0 is or isn't. That's why the research will only

discuss the most common web 2.0 applications on request of our supervisor at Volvo IT. The following applications are explained and will be analyzed: blogs, wikis, discussion forums and RSS.

3.2.1 Blog

One of the most used features of the Web 2.0 era is blogging. Personal homepages have been around since the early days of the web, and the personal diary and daily opinion column. Basically, a blog is a personal homepage in diary format (Answers.com, 2007). Functioning as an online journal, blogs can be written by one person or a group of contributors. Entries contain commentary and links to other Web sites, and images as well as a search function may also be included. Blogs typically report and comment on topics of interest to the author. It includes hyperlinks to other website and, often, photos, video clips, and the like. The most recent entry by the blogger is posted at the beginning of the blog, with earlier entries following in reverse chronological order; comments and other responses to the blog by readers are often posted after each entry (Answers.com, 2007). Blogs generally represent the personality of the author or reflect the purpose of the site.

3.2.2 Newsgroups, discussion groups and forums

A newsgroup in Internet terms refers to the old USENET discussion groups. Their original intention was news/announcement forums on specific topics. They evolved to become discussion forums (wiki.answers.com, 2008). Newsgroups are public bulletin boards on the Internet where you can post comments and reply to other peoples' comments. They are a useful place to find answers to questions or to talk to people who are interested in the same things as you. Newsgroup topics can be newsworthy, newsgroups have nothing to do with the daily news, and the term is somewhat misleading. Newsgroups are organized into categories and subcategories, with categories having the most diversity.

3.2.3 Wikis

A wiki is web-based software that allows all viewers of a page to change the content by editing the page online in a browser. This makes the wiki a simple and easy platform to use for cooperative work on text and hypertexts (Ebersbach and Glaser 2006). Wikis, and in particular Wikipedia, represent a promising principle that can significantly transform the Internet information age; they have greatly grown in popularity in recent months and years. Wikis can be used as a source for obtaining information and knowledge, and also as a method of virtual collaboration, e.g., to share dialogue and information among participants in group projects, or to allow learners to engage in learning with each other, using wikis as a collaborative environment to construct their knowledge or to be part of a virtual community of practice (Answers.com, 2007).

3.2.4 RSS

RSS is a format that allows users to find out about updates to the content of RSS-enabled websites, blogs or podcasts without actually having to go and visit the site. Instead, information from the website (regularly, new story title and synopsis, along with the originating website's name) is direct to the source were you easy can take part of the information you have selected. RSS is an XML-based data format for websites to exchange files that contain publishing information and summaries of the site's contents. Indeed, in its earliest incarnation, RSS was understood to stand for Rich Site Summary (Doctorow, 2002).

3.3 Web as a social network

The interest in networking and social activities has been around for decades most focusing on social behavioral science. Much of these interests have been focused on the relationships of social entities and the patterns within these relations (Stanley Wasserman 1994). The term network is often referred to nodes that have ties and it can be applied on any type of situations. A social network is a social structure made of nodes, which is often individuals, or organizations that are tied by one or more links. The resulting structures are often complex (Ellison 2007). Social network views in social relationships are in terms of nodes and ties most commonly. Nodes are the individual entity within the networks, and ties are the relationships between the entities. There can be different kinds of ties among the nodes. Research in a number of fields has proven that social networks operate on numerous levels, from families all the way up to the level of nations, and play a vital role in the way problems are solved, organizations are run, and the degree to which individuals succeed in achieving their goals (Ellison 2007). Social networks are formed between Web pages by hyper linking to other Web pages. The possibility to publish and gather personal information has been a major factor in the success of Web from the beginning (Stanley Wasserman 1994). These sites collect data about members and then store this information as user profiles. Social network sites offer a free and easy way to create personal Web pages and fill them with content such as blogs, digital photographs, favorite music, short video clips etc (Barsky and Purdon, 2006).

3.4 Human Computer Interaction & Interaction Design

Probably the most useful guideline for the Human Computer Interaction practitioner is to find an interface style of proven worth, and copy it i.e. designs of emulation. HCI is the study of people, computer technology and the ways these influence each other and we study HCI to determine how we can make this computer technology more usable. This means four things needs to be understand, the

computer technology, the people who interact with it, it is important to understand what is meant by "more usable" and finally understanding the work that people are trying to perform by using the technology (Dix and Finlay 1997).

Hewitt (2007) believes that Human-computer interaction is a discipline concerned with the evaluation, design and implementation of interactive computing systems for human use with the study of major phenomena surrounding them. By user the authors mean a group of users working together or a single user. By computer the authors mean all technology, anything from a simple computer to a large-scale computer system. And finally by interaction the authors mean any communication between a user and computer. This means knowledge is needed about both the humans and the computer to provide us with a complete picture. On the computer side, knowledge is needed about operating systems, graphics and programming languages etc. For the human side, knowledge is needed about theories, communication, social science, linguistics and cognition. In this thesis, the authors are not able to describe all of these areas; it would be too large and out of boundaries. But it is important to get a better understanding of HCI.

To be able to understand the nature of creating an enjoyable and useable web solution we had to take the Interaction design aspects into consideration. Interaction design is the process, within limited resource boundaries, which create, form and determines the characteristics in structural, functional, ethical and esthetical of a digital artifact for one or more clients (Löwgren et al, 2004). It focuses on how the user interacts with a page, application or product. According to Jennifer Preece the aim of interaction design is to bring usability into the design process. It is about developing interactive products that are enjoyable, easy but also effective to use. And in many sense it is about finding ways of supporting people. Preece continues by saying that through indentifying the specific weaknesses and strengths of interaction systems, we will begin to understand what it means for something to be usable or not. This means the products should be easy to use and support people and their tasks. Interaction design is increasingly being accepted as the umbrella term, covering aspects as what is being designed, including user interface design, software design, user-centered design, product design, web design, experience design and interactive system design.

3.5 Web design and usability

As the World Wide Web has matured, the need for high quality education in all aspects of Web design has become widely acknowledged. Web development has over the years become more and more focused on the user's needs and requirements. Usability is now a vital term in the world of the web designs. Web design is a word that explains itself, it's about making web pages that is displayed by a web browser or other web-based graphical user interfaces. Jennifer Niederst (2001) says that the key to make good design decisions lies in understanding your audience and considering how your site is going to be used. If it is a support site, make sure that the purpose of the website is to support the

users and nothing else. A web site that may make perfect sense for the developer may not make sense for the users. This means that it is important to determine the goals for the website from the perspective of the users. Nico Mcdonald (2003) talks about the difference between web design and the approach of other areas of design is that many of the challenges of Web design are about creating an effective interface between people and technology. This means that the focus should be on giving people access to tasks and presenting them with information, with this information they will be able to achieve goals that are meaningful to them. One approach of design is the user-centered approach. The focus is to ensure that a product is usable and is usually addressed through a user-centered approach to design. This means that there are different ways to achieve this such as, observing users, talking to them, interviewing them, modeling their performance, asking them to fill in questionnaires, testing them using performance tasks and asking them to become co-workers. A user-centered approach is often based on early focus on users and their tasks. Web usability is about making your website in a way so that your users can find what they are looking for fast and efficiently (Preece 2002). To make this possible your website has to be easy to navigate. Many main problems are that the websites are unstructured, the information that they are providing are disorganized and poorly structured. So poor usability means that people that are using our website cannot efficiently perform the tasks they intended to do. Usability is an assessment of the impacts of specific user interface design decisions upon the ease of use of the interface. For evaluating usability, it is necessary to consider the relationships between the product and its users in the first instance (Rees and White 2001). Although the web is based on a relatively simple interface consisting of buttons, menus, links and etc usability problems are common. When we speak about human memory we are focusing on three primary human memories issued to consider when we are designing for the web. First, if too many things must be remembered, something will be forgotten for sure. The second thing, the longer the time frame that things must be remembered, there is a bigger chance that there will be forgotten. And finally they will be confused with one another if there is a greater similarity among the remembered things. We will put some extra focus on the navigation of our support site as it is among the biggest frustration for web users (Brinck and Wood 2002). The navigation needs to be simple and comfortable for the user. Web design and web usability are two key factors in our study, as we have to design a support site that in the end is usable. The aspects that have been mentioned are the ones we will try to cover in our web site solution, we can not consider all the things that involves in web design or web usability because of the time limit and our wide research area.

4. RESULTS

This chapter is divided into two areas, the respondent's answers and the web analysis that has to sub categories, which are the web 2.0 applications and functionality. The interviews will be gathered as a summery and the analysis will be shown with tables and functionality aspects that are important to consider the website development.

4.1 Respondents answers

Here are the following results of the interviews that will be summarized. The interviews were mostly about support in general and some questions about functionality and web 2.0 applications. The Project Support Manager had knowledge about the functionality of support routines. He described that HP has three levels of support, helpdesk, first and second line for deeper problem solving regarding certain issues. He also described the chat function at HP is used to some extent. He also said he had not tested it himself, but he had heard from his co-workers that it is a good way to get support regarding smaller issues, with the ability to take control of the computer of direct support. He spoke about the HP term, "help yourself" (Scharlin M) which is about finding the solution on the web yourself instead of calling to the support. He also described HPs support program and different sites and showed how they worked and discussed his opinion about them. He didn't have many complaints and thought it is a great way of self-supporting. Magnus did not have any opinion regarding web 2.0 as a support use for the organization.

The application administrators had general information about Volvo support and how it worked; they even had some input regarding application issues. Mats gave his view on the telephone support system, talking about his experiences when encountering a specific problem and the steps to get it solved. He described Volvos different levels of support and how the interacted with each other, giving us a deeper insight in Volvos support routines and work. He also mentioned what kind of information and problem that the different levels handled. As an application administrator he was eager to get a better application support, but he said that it takes a lot of research to cover the application support issues, as there are a lot of different problem areas. Robert discussed his view on the problem situation in general and gave us input and guidelines that was useful in the project. They both were optimistic about a web 2.0 knowledgebase support and believed that it is the future for Volvo. They spoke a lot about sharing knowledge is the key for future success in any area. The meeting with Grzegorz meeting ended up in an open discussion that gave information regarding content like language setup, rating system, user information, and different aspects to be considered when making the website. He talked about his own experiences in the web development as well as the different thoughts he had about the different type of web 2.0 applications.

We observed a support technician and interviewed a support manager at Volvo helpdesk. We took some notes on the VINST system, which is the helpdesk administration system along with a couple of other minor applications that was used at the telephone support. This gave us some ideas as well some key information about the user information that they keep on record. Jonny explained the routines at the support, and he's view on the usability in the system. This information gave input to the design solution in regard to how to make the design useable and appealing. He even spoke about the current knowledgebase and said that it had a really bad search engine and he thought that it should be improved if the knowledgebase should be used. He also said that a self-support system through a knowledgebase should only contain easy and common problems; otherwise it will be complicated to find the correct solution at the end as well as entering useful information to others.

4.2 Analysis results

Here are the following results of the empirical data regarding the web applications and functions and content that should be considered when developing the site. It was most appropriate to visualize the data through a summarized table. The respondent's answers were input to these parts as well.

4.2.1 Web analysis

The analysis of the chosen web applications resulted in the following table. The table will display information that both of them had in common, but were handled differently. Here is the following comparison between the applications.

FUNCTIONALITY	WIKI	DISCUSSION FORUM / BLOGS
Visible users	No	Yes
Structure	Easy	Easy
Level of problem	Easy, first line	Problem solving, 2:nd - 3 line
Search function	Faster / accurate	Slower / inaccurate
Custom text "edit"	Yes	None
Text structure	Simple, no format	More formatting options
Discussion	No	Yes

Type of information	Facts	Ongoing and unsolved issues
Feedback	No	Yes
Loading speed	Fast	A bit slower
Level of unwanted distraction	Links can confuse	Much comments, time consuming
KB	Normal	More data compared to wiki
Time consuming	Quick	Often is (Searching)

4.2.2 Functions analysis

The following aspects were the most important regarding content and functionality that we looked into. The areas were language, moderator, users, messages and rating. They will be displayed as a summary of the things we thought was the most important to keep in mind when developing any of the web applications. In the next chapter these areas will be discussed in relation to organizational use.

Language:

- Every knowledgebase should have their own language
- Start with English
- Later on translate from English database to the others. (e.g. 100 most common problems).
- The flag will show the top 10 languages and a scrollbar with the minor languages as well.
- The language is set from the IP location.
- Knowledge will expand at it's own rate

Moderator

- Requires a moderator
- Full time job
- Have all the regular tasks such as control; make sure it is a good structure, users stay on topic, contact users etc.
- Should check out and control new questions and topics before they hit the page

Users

- Users has to be visible
- Visible for everyone - Names, Position, ID
- Moderator views all the information

- User able to pick who is available to see the information that the moderator views.

Messages

- Mailbox – contact regarding support
- When they create a new topic they can choose how they want to be notified when somebody has answered their question via SMS or mail.
- The user will set the SMS quantity.
- Saves the users a lot of time
- Can also pick the priority of the problem when they write a new topic

Rating

- The rating system will keep the support with relative content.
- Rating on topics and answers
- 1-5 rating scale
- Easy for users to se how good the solution is in general.
- High rating – Easier to find
- Low rating – removed after 10 votes
- Auto remove

5. DISCUSSION

This chapter connects the different parts of the study and gives possible answers to the research questions found in the fist chapter. Also included in this discussion is a research process with notions on what have been successful and what could have been done differently.

5.1 General study reflection

According to Patel et al (2003) it's important to reflect over the study and the outcome of it. This means we have to evaluate our study and describe how it went according to our expectations. This discussion will include an overall discussion about the research process and will also reflect on the results of the empirical study. The results of our studies gave us in the end one solution and our main question was to find out which solution we thought would be preferred as a user centered support system in an organization? But the big question is did we succeed? Yes we like to think so as our prototype can support users and help the users solve their problems.

As we preferred quality before quantity, interview felt as a good choice to make sure to capture all of this information. We do feel that the interviews didn't affect our results that much because the information were to indirect value as we focused on support in the beginning of this project instead of starting with the analysis of the web 2.0 applications. The methods that have been used, interviews and observation have worked well and it is difficult to say if any other method would have been more suitable. We discussed to use questionnaires but decided not to, because we felt that we didn't want quantity information in our research. Overall we are happy with the methods that we have been using.

One thing that could have affected the outcome of the interviews is that we perhaps have asked the questions in a way that affected the respondents in a negative way or pushed them to say the things we wanted to hear. The respondents were mainly for early information gathering regarding overall questions and some questions that focus more on the functions to the support site. This resulted most knowledge about the support at Volvo, which gave a lot of input and key information that had to be considered in making the prototype. But this information would only affect the results indirect as our prototype is built on the ideas of a wiki and a forum. The Prototype from Poland was a good source of information, because it was a directly a target to our purpose. This meeting was the only information that was useful to the prototype even though we had several meetings with different respondents on many levels in the organization. When we look back we felt that our questions could have been more focused on web 2.0 and maybe we should have tried to stay on topic a little bit more. Sometimes we attended to ask questions that wouldn't benefit us in our work but made us curious of the answer because the topic was so interesting. Another feeling is that we should have started looking at wikis,

blogs and forums earlier on and we might even then have gotten an even better result. We had a setback as we focused too much on the support and looked into other organizations telephone supports. Our research may have been a little too wide, and the consequences were that we had to change our time plan during the project. Our last weeks were only focused on to make sure that our solution is the best suitable for Volvo as a user-centered support solution. We couldn't find the time to look at the web design to much or develop our own layout. The prototype was an idea just to show our supervisor how it could look like and therefore we used the Volvo intranets layout and filled it with our web 2.0 ideas.

An overall impression of the research process is that it has gone well. We both think that it is impossible to go trough a thesis of this size without small setbacks, but we are satisfied with how the work has been carried out. We are proud over the results of this thesis, as we feel that we succeeded to do what we were attended to do.

5.2 General application reflection

The metaphors were taken from different sites on the Internet that are well known to the public and have had success throughout the years. We have tried to analyze what aspects that have made them attractive in regard to usability, which is a big part in a web applications success. We have taken the best fragments from different worlds into our solution, which served our purpose the best. Our analysis of web 2.0 and it´s applications were the most time consuming part of this thesis. Looking at all the well known sites and studying them was a great way to get better understanding of what the purpose with web 2.0 is and how it can be used to support and help one another. The analyses of the applications have gone well and made it possible for us to summarize advantages and disadvantages with the three main applications that were chosen for analysis. The analysis of web 2.0 applications was in the end of much more value for our results than the interviews with the respondents.

5.3 Web applications: advantages and disadvantages

We intended to find out which web 2.0 applications would be most appropriate for an organization to use as a user-centered support. We decided to analyze three web 2.0 applications to find out what was good and what was bad with them as a support solution. This is a discussion of our analysis of wikis, blogs and discussion forums.

5.3.1 Wiki

Wiki solves the problems by using simplicity and provide the users with facts about the problem. As the information is sorted in a god way the search function works well as it seems like it searches on the topics and headlines and not text. This is one of Wikis advantages as the search function is very important. Wiki could be a good solution for the problems that could handle the first line support, as we think that these are the only problems the users could solve by just finding the information in the wiki. In the wiki people are able to edit what other people have written, which is a good function so the information is always updated. On the other side it could be disagreements between users on what the information should be, which happens a lot on the Wikipedia.org. For more complex problems to people need explanations and be able to discuss what has gone wrong and this is an aspect that cannot be done in a wiki. As there is not possible to leave any comments, important stuff such as giving feedback or tips that could support is missed out and is a major disadvantage. The linking in Wiki works very well and its fast, but in some cases there is many links there could be a high level of distraction for the user. Another problem is the user's visibility when making a topic or editing a comment, because many users could edit or change the same text, it's not possible to know which person who has made an input to the text. This is big problem as organizations like to keep track on what the employees are up to and can correct them if they are doing things the wrong way. The best aspect of wiki is its simplicity that invites the user to change content in an easy matter, but it is also weakness because you might want a lot of functionality when you change text or other interesting features.

5.3.2 Blog and discussion forum

A Blog solves the problems by using a blogger to write about the topic the users are interested in. This means that the users are very depending of the knowledge of the blogger. If the blog isn't good, what will the users get out of it? They can ask questions later on in the "leave a comment function" if something isn't clear to them and the blogger will get back to them or somebody else that have the knowledge to solve their problem. As we have mentioned before, the blog could be hard to understand and maybe it doesn't concerned exactly your problem and therefore your questions may not be answered in a way you would prefer. If the leave a comment function is used in a good way it could support people with their problems that are in a higher level than wikis can, as people here have the opportunity to support each other by discussion. It is possible to get tips and feedback on your comments.

A Forum is all about discussion and has all the benefits a discussion can provide a user with but also all the disadvantages. The forum will consist on facts like a knowledgebase; it will rather be built on people's questions and hopefully the answers to them. Here people can write a question, have a discussion about it and probably find an answer. This is an opportunity to come up with new solutions, it may not work every time but there is a chance that the answer will be found. People that

are discussing problems are likely to build a strong cooperation and also maybe build a stronger relationship. As in blogs it is possible to get a tip on how to solve something or get feedback that can help you out in your current situation. The knowledgebase database is also bigger than Wikis because people discuss and do not edit each other's replies. But to get a reply to a question could take time and in that way forum could be time consuming as it also can take a long time to find an answer. A big disadvantage is the search function, because it searches most of the time on text and therefore you will get many hits and this will result in a wide search area, when you want narrow and precise search hit.

5.4 Content and functionality

The following is a discussion of some problem areas regarding content and functionality on the website. How should the site be managed, how do we solve the language issue and what type of user information should be displayed when making a comment on any of the applications are some of the topics discussed. The topics are discussed below:

5.4.1 Language

The language question is problem we had to solve in our website solution. As there are many people that work within Volvo that doesn't speak English in other countries, we had to come up with an idea that would support these people as well. We decided to make sure that the website is available in different languages. Each website will have their knowledgebase database where the information will be stored in their language. This means every database will have their own standard regarding languages. But we do recommend Volvo to use the English database in the beginning as it will contain most information and it could take time for the minor languages to get filled with problem solving information. We think that the website should be available in as many languages as possible to save money later on, but early focus on big languages such as English, Russian, French, Spanish and Chinese is recommended. Depending on the users location the website will be shown in the user's home language by IP-address localization.

5.4.2 Moderator

We felt that having a moderator will automatically result in a better structure on our support site. The moderator needs to control the forum, make sure the users stays on topic, and move the questions and answers to the right topic. The moderator also needs to make sure that the forum is clear from cursing and replies that doesn't make any good sense, he has the power to warn people by sending them emails and also ban if that is necessary. We consider that it needs to be a full time job as it will be so much to do for somebody that works part time. Especially if you're a moderator for a blog were you

need to update the blog daily. The moderator should also be the one that check out and control new questions and topics before they hit the forum.

5.4.3 Rating

The users must be able to see the difference of what is actually good and was bad so they don't waste their time on finding bad solutions to their problems. The rating system to our support site is an idea to make sure that the topics are there to support people in a good way. The rating system will be on a 1-5 scale and users will be able to rate others users answers and topics so it will be easy for others to see how good of solution it could be in the end. At a low rating the comment will be removed by an auto function and the moderator will get a request then he can confirm the removal of the post. To make sure that a comment is really bad or something is wrong with it, the request will not be sent before it has gotten at least ten votes.

5.4.4 User information

To make sure that people can rely and trust one another, all the users need to be visible for everyone. Users are supposed to see other user's names, their positions and their ID numbers. These are the personal facts that are common and will be visible for everyone, but the moderator will have the other facts that are required, such as mail etc. The users will also have the choice to let everybody else see the rest of their facts. This will make it easier for them to cooperate. They will be able to choose from options such as people by their own choice, people that are on the same floor, people that are on the same location, they can choose their list by using ID or people that have the same contact net. The moderator should of course view all the information.

5.4.5 Messages

The users should be able to direct contact one another if they want to do so. Therefore the message function needs to work smoothly and efficient. First of all every user will have their own mailbox so people can contact them regarding support. This will only be a mail they use in support terms. When the users creates a new topic they will have the choice of picking how they want to be contacted and notified that somebody has answered their question in the same topic. The choices users have are by telephone, email or just leave it like it is to later on check it out. If the users pick mail or SMS they will only get one message and that is for the first reply no matter how many replies there is. This will save the user with the question a lot of time, as he/she doesn't need to go in and out on the webpage all the time to check out if somebody has answered him/her. If the user checks out the reply and isn't happy with it he/she can once again choice to be contacted by SMS or mail. Only one SMS will be sent if the users picks to be contacted this way and not by mail. When the user creates a topic, they

can also pick the priority of the problem, by making it an urgent problem will hopefully result in a faster answer.

6. CONCLUSION

Here are the thoughts and conclusion gathered of the research results, there will also be recommendations for future work within the area that should be considered.

The problems that occur on first line support can be handled in a good way by using a wiki and the concept it delivers. We think that the problems the first line support issues can be handled by a user if they are provided with good instructions. We also believe that problems with a little more expertise is needed such as in second line and third line support can be solved in many cases by using a forum and letting users cooperate and share their knowledge to do so. We also believe that this is a great complement to the phone support as the facts always is available in the wiki and it's always possible to get solutions, tips or feedback at the forum. Blog was the alternative we analyzed and left out as we felt that blogs often tends to be personal and it would require a lot of experts to make this work in a good way. We do believe like our result shows that wikis and forums have many advantages and combined them can support users in a satisfying way like our prototype shows.

We have come to the conclusion that web 2.0 is worth using in organizations and can make the support even more effective. We predict that web 2.0 does indeed belong to the future and the way it let the users have the control of the information. The way we have combined wiki and forum into one is definitely a way that could reduce telephone costs and a new way for the users to help themselves. Whatever the solution maybe, if it's a blog, wiki or discussion forum users will cooperate in a new way and most importantly they will share their knowledge. We feel that our solution gives them the opportunity to search for answers to their problems but they are also able to discuss them to at a later stage to finally find a solution together. The opportunities that wiki and forum gives the users by letting them share their knowledge and support each other and the combination of them makes it possible to use a dictionary and a discussion forum on the same platform is unique. This new problem solving way that will saves money for Volvo, it makes sure that the users corporate in a way that they interact even more and use their valuable knowledge.

6.1 Prototype

This site is not complete, but its purpose is to show how web 2.0 aspects should be taken care of at each part. Figure 1 shows a mix-up between Volvos intranet, the separate e-support application and the added RSS function to the right. The main reason for this approach is to use the web 2.0 aspects and give the support intranet a gathered location for support issues as well as making it more

dynamic. With dynamics it will be more customized for the user, which will provide the user with information in different areas like support, new forum threads or important information at Volvo.

Figure 2 shows the Wiki part because this area contains relatively easy support problems in regard to printer, password, and other common areas of support. Wiki is best suited here because of the nature of the problems are simple and a majority of people at Volvo could give their input in some way. The displayed area is all facts and works like a dictionary, which also suits a Wiki, the most. Wiki should at the end be like an extended FAQ (frequently asked questions), which will be updated at the pace that the users provide useful information.

By clicking on any of the icons, the user will be taken to the problem solving information regarding a specific area. Here is where the information is shown about the problem and the typical Wikipedia ”edit” function will be enabled for any user within Volvo to change or add content that the user feel is appropriate. On the right side of the support page the RSS feeds will be available as shown in figure 3, the support feed or thread update will be displayed. The general tab will always be there because it’s concerning critical information that is regarding Volvo in some way. It’s a simple way to see what kind of news that is critical and could affect your current work. E.g. “Server is down concerning...” is shown and if you click on it you will get to the information board with more information regarding this issue. It will work like a widget, which could be compared to the sidebar in Windows Vista were you add the feeds or applications that will suit your work the most. Even the icons on top will be support related, which will give the user an additional way to connect to the support. The user will be able to chat, use net meeting (a voice or video meeting) or some other application that is provided for support, which we don’t know yet. This show the functionality and idea of how it could work. Visit www.igoogle.com to take a look on how you customize your own web layout.

6.2 Proposition for the future

One thing that is essential and a thought for a future implementation is the search function. What use is a large database if no one can find what they are looking for? As we spoke with the support they said that it was an important step to make a knowledgebase successful. How many times have you used a web search engine and not found the relevant information, this could lead to frustration or even the worst case of all that you don’t want to use the search site again. If that is the case at Volvo a lot of users will end up using the telephone support instead of finding the answer in the jungle of solutions. This scenario will not only keep the cost at the same level, as before, it will even be harder to implement a new database. When a user has experienced a bad site or functionality he probably will not use it again for a long while, even it is updated and works better than the previous time. So when implementing a system it is vital that the release will give a good first impression so the user not

loses interest in the application. We do believe that Facebook has many interesting functions that could be used in organizations and are therefore very interesting in future web 2.0 researches.

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Appendix

Figure 1 -The support website

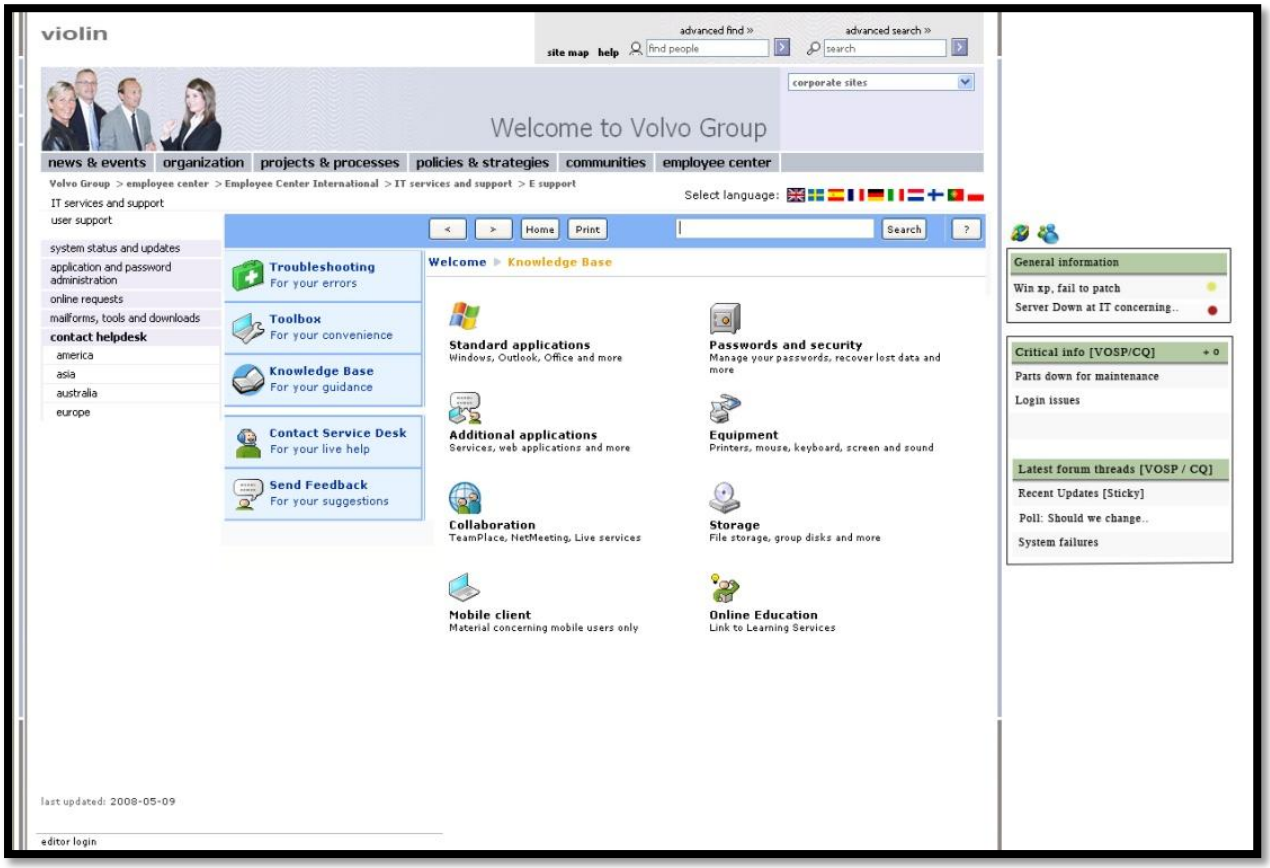
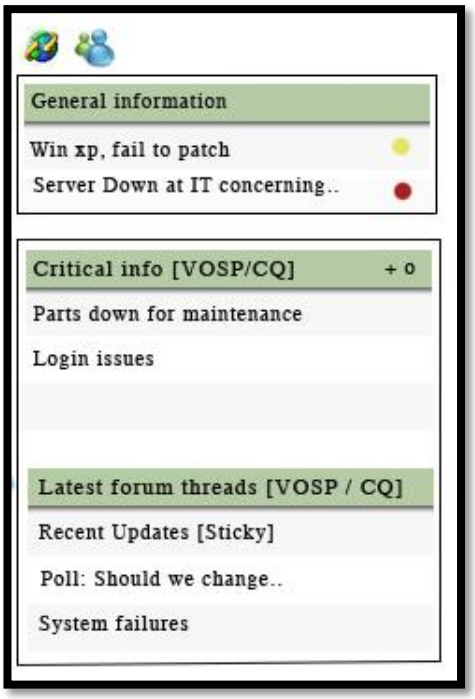


Figure 2 - Highlighted wiki part

Figure 3– RSS


General information
Win xp, fail to patch
Server Down at IT concerning..
Critical info [VOSP/CQ]
+ 0
Parts down for maintenance
Login issues
Latest forum threads [VOSP / CQ]
Recent Updates [Sticky]
Poll: Should we change..
System failures