Usability Analysis of Working with SAP Applications in Volvo Group

Xun Liu

Institutionen för informationsteknologi
Department of Information Technology
Abstract

Usability Analysis of Working with SAP Applications in Volvo Group

Xun Liu

This thesis is a report of a master thesis project work. The project was performed at Volvo IT, Gothenburg, from March to September of 2013.

This study targets SAP ERP applications. SAP AG is one of the biggest enterprise resource planning software corporations and the ERP system is one of the most famous products of its. As one of world’s leading manufactures in the field of trucks, buses, construction requirement and marine and industries engines, Volvo Group has more than 50,000 users are working with SAP applications. The purpose of this project is to evaluate the current SAP application in Volvo and propose several strategies for a new interface.

This usability study is consisted of observation, interview and questionnaire. The result is based on a total number of eight interviews and twelve questionnaires. Proposals are given in the end for five aspects. They are a combination of ideas of my own and the new technologies published by SAP AG.
Appendix 3: Questionnaire of ERP Usability Criteria

Appendix 2: Questionnaire of SUS

Reference

7. Conclusion

6. Discussion

5.6!Learnability
5.5!Presentation
5.4!Customization
5.3!Navigation
5.2!Task!support
5.1!General!summary

4.5!Procedure
4.4!Questionnaire
4.3

4.2

4.1

3.1!Human!Resource

2.3!Evaluation!Criteria!for!Usability!of!ERP!System
2.2!Usability
2.1!Volvo!Group!and!Volvo!IT
2.2!SAP
2.1

1.3!Delimitation
1.2!Research!Questions
1.1!Purpose

1.1!Introduction

1

Contents

1.1!Purpose

1.2!Research!Questions

1.3!Delimitation

2. Background

2.1!Volvo!Group!and!Volvo!IT

2.2!SAP

2.2!Usability

2.3!Evaluation!Criteria!for!Usability!of!ERP!System

3. Work with SAP applications

3.1!Human!Resource

4. Methodology

4.1!Research!Approach

4.2!Observation

4.3!Semi-Structured!Interview

4.4!Questionnaire

4.5!Procedure

5. Result

5.1!General!summary

5.2!Task!support

5.3!Navigation

5.4!Customization

5.5!Presentation

5.6!Learnability

6. Discussion

7. Conclusion

Reference

Appendix 1: Agenda of interview

Appendix 2: Questionnaire of SUS

Appendix 3: Questionnaire of ERP Usability Criteria
1. Introduction

Since early 1990s, many companies around the world have made their information technology (IT) strategy to deploy enterprise resource planning (ERP) systems. The aim of ERP system is to integrate and manage different business processes with information technologies. Volvo IT has been working with SAP AG from 1996 for the development and implementation of business solution. Right now, Volvo IT has over 43 SAP systems and provides service to more than 50000 users in Volvo Group.

SAP applications play an important role in the employees’ daily business processes. Despite the great benefits, SAP applications always challenge users with the complex ERP interface [1]. The Usability problems of applications can have serious impact on user's performance and productivity [2]. For instance a user's productivity can fall down 40 percent due to the frequent switching of tasks and applications, according to a manager in Volvo IT. They can also lead technologies to poor acceptance by users, which mean a wasting of money and resources, and shortened return on investment [3]. These reasons motivate the company to improve usability and user experience.

1.1 Purpose

Recently some roadmaps for user experience improvement projects have been published by SAP AG. However a successful project could be consisted of a seamless collaboration between external and internal efforts. The thesis will be a part of the User Experience improvement works of Volvo IT. The purpose is to: investigate and reflect the opinion of end users; figure out their expectations. If the whole organization can benefit from these, the working environment and productivity can be improved significantly.

This usability analysis is developed with Volvo IT and other companies of Volvo Group at Gothenburg. Eight users from three different departments have been visited and interviewed on site or remotely.
1.2 Research Questions

The thesis will focus on the following research questions:

- How did the users experience the current applications and challenge with the real business process?
- How do users rate the current SAP applications’ performance?
- How is the usability situation of the SAP applications?
- What are the possibilities to improve the usability through the new technologies?

1.3 Delimitation

This thesis is a usability study of the current SAP applications with the end users in Volvo group. The users are basically from Business Service organization. The users in other organizations can have different demands and attitudes about SAP. Furthermore, many SAP users are working outside Sweden. It will influence the usability since the difference of the culture, langue and working environment. They are impossible to reach and visit in this study. Only one user in India was involved in this study. More users from the different counties can contribute to this topic on the next step.

The purpose of the study is to suggest strategies and prototypes from user experience aspects. This paper is limited to evaluate the applications that are currently running in the three departments. In a consideration of security from Volvo, many research and conclusions are based on the IDES, which is a training system. It is not a working system with real data. It can make a difference to the real working environment.

Architecture and technologies will not be covered in the thesis. SAP applications are commercial software and sold through the form of license by SAP AG. Volvo IT does not have the copyright of the applications. Any potential changes should be under the permission of SAP AG.
2. Background

2.1 Volvo Group and Volvo IT

In 1915 Volvo was a subsidiary of SKF. Assar Gabrielsson and Gustaf Larson decided to build a car that can be driven on the severe road and survive in the cold winter of Sweden. The company was officially founded in 1927 and made the first car at the same year. Since that, Volvo Group became one of world’s leading manufactures in the field of trucks, buses, construction requirement and marine and industries engines. Furthermore, the group also provides complete solutions for financing and business service [4].

Today the most important values of Volvo are:

- *Creating value for customers in selected segments*
- *Working with energy, passion and respect for the industry*
- *Driving quality, safety and environment care*
- *Keeping moving forwards and innovations*

Volvo IT is a wholly owned subsidiary of the Volvo Group. Volvo IT has 40 years history and provides solutions for the areas of the industrial process, Product Lifecycle Management, SAP applications and IT operations. It services both internal and external customers. Volvo IT has expanded rapidly since it started and today it is a global company with over 6000 employees in over 35 locations around the world. It is the preferred IT service supplier within Volvo Group [5].

Since the mid-1990s, Volvo IT has been introducing system support for different business processes at Volvo Group and other industrial companies. Volvo IT has supplied SAP solutions to more than 200 companies and has been certified as Hosting Partner by SAP AG. It is a proof that Volvo IT is a capable partner in utilizing SAP solutions in an efficient manner. The relation about SAP AG, Volvo Group and Volvo IT can be illustrated as *Figure 2.1*. 
Figure 2.1: The relation between SAP AG, Volvo IT and Volvo Group

2.2 SAP

SAP AG is a German software corporation and a world leader in enterprise application software and related service. They claimed themselves providing functionality supporting to a global orientation, which will lead to sustainable competitive advantage and growth for all size organizations. They are providing solutions for managing business and customer relations to over 248,500 customers in 188 counties [6].

SAP stands for System, Application and Product in Data Processing. There are several applications suits produced by SAP AG, in the thesis these area will we investigated:

- Human Capital Management (HCM)
- Supply Chain Management (SCM)
- Financial Management (FM)

In 1992, SAP AG delivered SAP R/3, which is the third release of the software. It was renamed SAP ERP and some other names in the past years. The deployment of new architecture makes it possible to be compatible with multiple platforms, such as Microsoft Offices. Figure 2.2 is the standard SAP Easy Access interface. And it is the one using in Volvo. This generation of SAP applications is being always called SAP GUI transaction as well.
2.2 Usability

Usability is defined as ‘The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use’ by International Organization for Standardization (ISO 9241-11). And according to the usability expert Jakob Nielsen [8], usability is composed of:

- **Learnability**: How easy is the design for fresh users to accomplish basic tasks?
- **Efficiency**: How quick can experienced users to accomplish tasks with the design?
- **Memorability**: How easily can experienced users get back to the design after they are off for a period?
• **Errors:** How serious can the errors be and can users recover from the errors easily with the design?
• **Satisfaction:** How pleasant can users be when they achieve the tasks with the design?

Some people might hardly distinguish the term usability and user experience (UX). Tom Tullis and Bill Albert [9] has discussed this in their book and said that the user experience takes a broader view than usability. UX is not only considered the ability of the user to carry out a task successfully but the entire interaction with the thoughts, feelings and perceptions from the result. Therefore, when ‘usability’ is mentioned in the thesis, I am really talking about entire user experience.

One of principals to look at usability was introduced in the book of David Benyon [10], and it is called PACT:

• **People**
• **Activities people want to undertake**
• **Contexts in which the interaction takes place**
• **Technologies (hardware and software)**

A human-centered design system has to achieve a balance between these four essential elements. There are two relationships can be found between the factors. *Figure 2.3* illustrates the relationships.

![Figure 2.3: the balance with PACT elements](image)

In the left side there is a relationship between people and technologies that they
interact with. This relationship focuses on the graphical user interface (GUI). The relationship in the right is that looks the people and technologies as a whole, and interacts with the context of activities, which are being undertaken. The idea of the second relationship is that sometimes people and technologies have to be considered as a whore.

2.3 Evaluation Criteria for Usability of ERP System

There are several guidelines for evaluating the usability of systems, for instance Nielson's ten heuristics and Shneiderman's eight golden rules. Although these two sets of usability rules are widely used by evaluators, it does not focus on the usability of features that are specified to ERP systems [11]. The authors discussed and developed the rules based on some published studies of ERP systems and concluded into five essential criteria which are:

- **Navigation**: which aims to determine the ability to perceive and identify proper information and functionality correctly and effectively.
- **Task support**: which aims to help users with an effective task support to complete tasks efficient by an alignment between the systems and the real business processes.
- **Presentation**: which aims to determine the degree of complexity of the interface’s layout and output of information for users to perceive and comprehend.
- **Learnability**: which aims to determine required affordance of learning how to use the system.
- **Customization**: which aims to determine the effort of customizing the system in order to increase the users’ productivity.

These criteria will be the foundation of this thesis. And the agenda of interviews and questionnaires are based these five aspects of ERP system.
3. Work with SAP applications

This chapter includes an introduction about the work in Human Resource Department. The users in the other two departments receive requests from different clients, which are not the same as Human Resource. And the transactions are different as well. However they have the similar procedure and will not be described for detail.

3.1 Human Resource

In the office of Human Resource (HR) department, users work with two screens and a keyboard with touch device. The responsibility of user in Human Resource Department (HR) is to guarantee the employee’s information such as organization code is accurate. They receive requests of job position changing from users within a web application. It looks like an E-mail box and illustrated as Figure 3.1.1. Users can find the Service Requests number (SR #), the statues, the priority and a brief summary on it. By clicking the items, a page with detailed information can be found as Figure 3.1.2.

![Figure 3.1.1: Query of orders](image-url)
The users usually generate the page into a file and print it out. The essential parts will be marked by pen, and users search via employee's number in the SAP application to find the data. The interface can be seen as *Figure 3.1.3*. Then users will sign the name on the paper to remind themselves.

*Figure 3.1.2*: Detail page of request

*Figure 3.1.3*: SAP used by HR
4. Methodology

4.1 Research Approach

Research is a process of inquiry [12]. The basic idea is to create specific questions and then methodically find the answers. There are a lot of research methods. Some of them cost more than others in both money and time. Although an expensive method may find more usability problems, in consideration of time and other resource, the semi-structured interview and questionnaires are chosen for this usability study. The research process is divided into two phases. First I carried out interviews and took observations at the users’ office or by remote. And I sent the survey to the user after visit.

4.2 Observation

The term ‘observation’ is something that means ‘to watch’ and ‘to pay attention to’ [13]. It is a sample and low-cost method for data generation. When we are observing someone, most of the researchers do like seeing, talking, hearing, taking notes and making inference of the time.

There are two approaches of observation method: overt and covert. In covert research, the person who is being observed does not know the action. The research is hiding somewhere like a spy. The advantage of covert observation is that the researcher is not disturbed and behavior of the person is completely nature. However the chance of communication with user is lacking and researcher has to fully understand the procedure. In contrast of covert research, the people know they are being observed with overt observation. The advantage is that the researchers are free to ask as many questions as they like. However the disadvantage is known as ‘Hawthorne Effect’ – the subjects are disposed to modify their behavior because they know they are being observed [14]. In this case, the overt research was chosen since it sounds more reliable and ethical. The permission was asked from the managers of different departments to visit and observe.

4.3 Semi-Structured Interview

An interview is a particular conversation between two of more people with a set of questions. The interviewers usually have an agenda they want to find out about. This means the topics of the discussion do not occur randomly but have
been planned in some ways by the interviewer. If the applications are in used, it is a better way to analyze the usability problems with the collaboration between observation and interview. Interviews can be divided into three types: structured interview, semi-structured interview and unstructured interview. A structured interview has a strict set of pre-determined and scheduled questions for the interviewee. The interviewer usually read out all the questions and does not allow one to divert. One of the disadvantages of structured interview is that the interviewer does not really engage into a conversation with the interviewee [15]. It is important to read out all the questions in the same way to every interviewee and not to affect him or her by your own views.

While a structured interview has a rigorous set of questions, a semi-structured interview is free for the interviewer to change the order of questions and allow additional questions if any topics are brought up during the interview but was not prepared. The researchers still have a list of specific topics to be asked and explored in advance but it is always open for the interviewees to be able to speak more detail and introduce issues of their own thinking that are relevant to the themes. It takes more time but give a better result when the interviewees can response more freely.

In this thesis, the interviews with end users of the SAP R/3 applications are the major approach and output. It is also a course for me to learn something about SAP and business processes during the interviews. The applications and interfaces are developed for the users to interact with, so nothing is more valuable than their answers.

A total number of eight end-users have been interviewed for their the experience and thoughts of SAP applications. The participants’ attributions can be seem in Figure 4.3
<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>Solution experience</th>
<th>Skill level</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>7 years</td>
<td>Skilled (key user*)</td>
<td>Accounting</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>5 years</td>
<td>Normal</td>
<td>Accounting</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>3 years</td>
<td>Skilled</td>
<td>Accounting</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>5 years</td>
<td>Skilled (key user)</td>
<td>Logistics</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>4 years</td>
<td>Skilled</td>
<td>Logistics</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>2 years</td>
<td>Skilled</td>
<td>Human Resource</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>2 years</td>
<td>Normal</td>
<td>Human Resource</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>1/2 year</td>
<td>Beginner</td>
<td>Human Resource</td>
</tr>
</tbody>
</table>

*Key user*: key user is an advanced user who assists other users with regular problems in the office

Figure 4.3: Participants’ attributions

There are some users who have not used SAP applications for a long period compared to experienced users who have worked for years; key user compared to casual user with average skill. Seven interviews were in their daily working environment, which means in their office, and the one was interviewed by remote. The questions is generated in following sections:

- The background information of the interviewee, for instance, the job title, the organization of employment and the length of service.
- A list of topics and questions based on the Jakob Nielsen’s theory and ERP evaluation criteria, which are mentioned in chapter 2.3 and 2.4.

4.4 Questionnaire

Questionnaire is a simple form of usability evaluation. It usually includes a set of pre-defined questions and combined in order and is sent out to the target sample. The major goal of a questionnaire is to find out ‘the ideas, knowledge, feelings, opinions, attitudes, and/or self-report behavior’ of a defined object. It is the most familiar and pervasive form of research method in society science [16].

Two questionnaires were used to extend the interviews and generate data for this thesis. The first one is a questionnaire of closed questions with Likert-scale
items. This questionnaire was inspired and designed by the heuristics rules and ERP Criteria mentioned in Chapter 2.3. The other one is System Usability Scale (SUS) by John Brooke [17]. It is a widely used in usability engineering of electronic office systems. The first questionnaire will be used as a major one since it is more specified on the ERP system. The second one will be used as a reference in the result and discussion.

After the interviews, a total number of 16 questionnaires were sent out to eight users. Four additional responses were received from the colleagues of the interviewees. The questionnaires were generated and collected by Google Docs.

### 4.5 Procedure

The every first idea came out in my mind for this thesis is conducting a usability heuristic evaluation with end users. However the recruitment of participants can be major problem. For a test plan a minimum of 10 to 12 participants per condition is necessary [18], which is hard to conduct. The users in Volvo have their works and responsibilities and they cannot spend some much time for the evaluation.

Observation and interview became a second thought. It is less time-consuming work and won't disturb users while they were working. The first goal was to get the contact with department manager for the visiting permission. Each manager introduced some users in their response. Unfortunately, the list of users is not big. It took the major effort in the study to schedule meetings with the users.

Next step was to do some a pre-study of the SAP applications they mainly use before the visits. Seven semi-structured interviews were made at the company's office with some predefined questions. And one interview was done remotely. All users were very pleased to have someone from IT department to ask and talk to them. And their explanations and answers are the worthiest treasure to the study.
5. Result

The information in the chapter is arranged in a sequence according to the rating from the users. These results can be categorized into six phases:

- General summary
- Task support
- Navigation
- Customization
- Presentation
- Learnability

5.1 General summary

After all the interviews and questionnaires, various data had been gathered from the end users. To calculate the score of the ERP Usability Criteria questionnaire, and the result can be seen in Figure 5.1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>Sum</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Task Support</td>
<td>25</td>
<td>2.08</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Navigation</td>
<td>24</td>
<td>2.00</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Customization</td>
<td>21</td>
<td>1.75</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Presentation</td>
<td>19</td>
<td>1.58</td>
<td>1.5</td>
</tr>
<tr>
<td>5</td>
<td>Learnability</td>
<td>13</td>
<td>1.08</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*Figure 5.1: Result of ERP Usability Criteria questionnaire*

The total number of samples is 12 and 4 is used as the best points in the survey. It is easy to calculate that 24 points is the average line. In these five criteria, three of them are below the average line and the other two are just on or above the line. Apparently the users are not so satisfied with the applications. More detail will be discussed in the following chapters.

5.2 Task support

Task support or work support, it is the ability which aims to help users with an effective task support to complete tasks efficient by an alignment between the systems and the real business processes. Although the score is not spectacular, it occupies the best position. The points are illustrated as Figure 5.2.
To find out the reason why users scored this criterion as the best points, the first thing to do is to understand what the tasks are.

The first thing is to summarize the observations during visits to figure out the top performed tasks. As the working environment introduced in the previous chapter, the most common working scenario is receiving requests or documents from some non-SAP applications and then perform jobs in SAP environment. An example can be given: the amount of salary has to be changed since someone shifted the job position. So he or she needs to fills a form and sends it to the HR department. The necessary information for the user in HR department to accomplish this request is the name or ID, request type, statues, job title and salary. So the user will intuitively type the name or ID in the input field to access the data. If something is wrong, users cannot find the name or ID. Then they have to search the requester by the users themselves. When the information of a request is displayed, the user will validate the data are correct or find the difference and sign on the print paper of the request. It is kind of similar when other departments handle this type of tasks.

These tasks can be concluded into three operations: typing, searching and displayed. There can be more complex tasks in other scenarios, however the users in this case do not have to perform work in a high degree of complexity. This fact can explain why it is scored the best. The users do not have many complicated interaction with the applications and the functionality can just meet their requirements.

Figure 5.2: Score of task support
Four choices are less than two points, which is the average line. It is not surprising that one third of the users are not satisfied with the tasks support. Although the demands from users are not complex, they find difficulty when reading the information. This is the issues about presentation and will be discussed in the later sections.

The response time could be another factor that affects the rating. Sometimes the time from the users have clicked at a button to the result screen is too long. Customers lose the control of the system because they do not see any difference between an in-progress application and a no-response application. The loading bar is on the bottom of interface and not that prominent. The poor response time does not help users to improve the productivity. However the tolerance of response time is not a universal problem, not every user has faced the challenge. It may depend on the size of the storage data in the database in a high possibility.

5.3 Navigation

Navigation is the prime door for user to interact with application. It is about the ability for the user to perceive and identify the functions and information correctly and efficiently. The total points of this category is 24 can be seen in Figure 5.3.1.

![Navigation Chart]

*Figure 5.3.1: Score of navigation*

It is interesting that the majority of the users tend to a neutral position while the
other half have a completely oppose attitude. The amount of applications that users need to execute for their work can be a key factor.

Users are pretty satisfied with the function, which is called Favorites menu. During the observation, almost every user started the transaction from here. This is a function that allows user to save the transaction as a bookmark in the left side panel on the main screen. They can insert an item through right-click mouse. The list can contain some files and web address as well. Like Figure 5.3.2, it is located above the SAP menu. The Favorites menu is conducive to save the time. Each item consists of the transaction code and the route. The users can access the transaction quickly and easily. The standard SAP menu is in a hierarchy model. It means the users sometimes have to drill down into the menu to find out the transaction that is desired. This is a convenient design for users to navigate the menus and it is low cost to use. It is similar to use web browser and costumers do not have to learn any new knowledge to use it. It reduces the barrier to apply a technology.

Figure 5.3.2: Favorites menu and SAP menu

However if users apply a large number of applications when they work and just save all of them into Favorites menu. Users do not notice that the list is just a lite version of the default menu. This result in Favorites menu with mass number of items, which makes it hard for users to explore, just likes the SAP menu. And
users are not used to arrange the items they saved, which lead the list to disorder and hard to navigate. Senior users solve this with their experience. They use the Favorites menu with intuition. Experienced user can activate the transaction without looking at this area.

SAP provides some more options for the navigation functions such as transaction code and shortcut (Figure 5.3.3). For using these two methods, users have to memorize all the codes they need or generate a shortcut on the desktop by their own. Neither of these two methods is easy. For the first one, it takes lots of effort to remember the codes and users do not have the motivation for that. And the reliability for the second method is poor. It does not work successfully for all transactions, commented by employees in Volvo IT. So maybe the Favorites menu is not perfect, but users choose it as a main navigation method since it is easy and familiar to what they are used to.

![Figure 5.3.3: Transaction code and shortcut](image)

5.4 Customization

Here we come to the parts that are below the average points.

Customization of personalization, for more demotic, is the ability to allow user modify the interface for their best productivity. And it got 21 points (Figure 5.4.1) and ranked the third worst in the questionnaire.
Figure 5.4.1: Score of customization

However during the all observations, it seldom found nobody has done any customization. Then how did they do the rating? It is a strong possibility that some of the users count Favorites menu as a part of customization and rate for it. There are abstract and tricky concepts for users and do have some overlap.

More reasons can affect the rating, and one of them is motivation. A customization menu can be very complicated for users like Figure 5.4.2. The menu consists of various tabs and options, which are not user friendly at all.
Furthermore, the motivation from the IT service side is lacking as well. One of the biggest issues is the cost. They wish to maintain and support SAP applications with the lowest cost. For an example, a user may find his or her interface is different from someone else. Or he or she can lose some necessary functions and has no ideas about that. Then someone from IT service must assistant him or her. In a consideration of the amount of total users, the cost of manpower and time will be not acceptable.

For these reasons, the IT people did not introduce the customization functions to the user and the functions are even banned from the users. As the two sides of a coin, the benefits and cost of a technology is a critical concern.

### 5.5 Presentation

How the SAP application presents information on the interface is always being criticized. As perviously said, the complex interface has been challenging the users when they start the work. In this survey, this category is ranked as the second worst points (Figure 5.5.1).
The layout of interface is not well sorted at all. Users have problem to understand what the icons and menu items stand for. Few icons and menus had almost exactly the same function. An example of the redundant information can be more illustrative as Figure 5.5.2. The icons on the navigated bar have the same functionality as the first drop down menu. According to a manager of Volvo, these are caused by some historical reasons. Before a certain version of SAP system, icons were not introduced for the interface. Maybe SAP AG just added these icons for a trend and they did not well arranged for the functions. Furthermore, most of the icons have never been clicked. They are just on the interface and the users have no interesting about them. Most of the icons are not representing the function the users want.

Figure 5.5.2: An example of redundant functionality
The unreasonable usage of the screen is another issue. As Figure 5.5.3, almost half of the screen is remaining blank. It causes additional operations for the users such as windows switching. Users were suffering from this, and they complained that too many click operations made their finger and wrist hurt. This unhealthy working situation may lead to a poor productivity. The users’ working speed can be lower than usual and more breaks have to be taken.

![Figure 5.5.3: Waste of the screen](image)

The system is displayed in the language of English. However the SAP is a German company and the ERP system is original in German language. Only translating the language may not be enough. Some users comment that a few words are just directly translated from German to English. They think these words are not matching the daily jobs and may cause some problems to someone who speaks English as a second language.

### 5.6 Learnability

Every user would agree that SAP is hard to use in the very beginning. It takes a
very long time to become a skilled user. The length of learning time depends on the user's IT knowledge and previous working experience. It will not surprise anyone that the learnability is ranked at the last. It is rated for only 13 points, which is out of 48 by the users (Figure 5.6). However, the rating of 4 points is so distinct. He or she could be a very senior user with solid knowledge with ERP applications. He or she might use some other ERP system before, than get start with SAP application will be a piece of cake.

\[\text{Learnability} \]

![Learnability Chart](image)

*Figure 5.6: Score of Learnability*

The poor presentation of the information is a major barrier to the user. A user who has just started work for six months commented that he had no idea about reading the information on the interface.

The lacking of training for SAP applications is another reason. A new use is supposed to be trained by the key user. However, he or she has to explore the system by himself/herself. The key user has to work on the regular daily job and provides assistance when the new user is facing any problems. Many users said that their colleagues were the teacher. Not only the key user, they just ask any one in the office and inherit the experience. This may be not enough for a new user. If the problem learnability is impossible to avoid, than there should be more resources being invested for educating the employees.
6. Discussion

The questionnaire tells that the majority of the users think SAP applications do help their jobs. But the satisfaction has a large space to improve. Than a question that came out is how to provide better support to the customer?

Colors are important to use in design. It can make information more accessible [19]. Right now, SAP is just few colors on the interface. It is using black for the text and blue for the background. Aaron Marcus suggest six ways to support user experience with color [20]:

- Identify subsystems or structure
- Add coding dimensions
- Emphasize important information
- Increase comprehensibility
- Reduce errors of interpretation
- Increase believability and appeal

According to the interviews, the term of ‘emphasize important information’ is prior desired. There should be more color in the interface to distinguish the key information. Another option is to provide some filter functions for the user to hide or fade the disturb information. However this will increase the burden on the user and cost to maintain, like as the discussion in paragraph 5.4.

As the most common tools for all users, Favorites menu provides significant support for the navigation. However it will be less useful when the user has a large number of transactions to execute. To be more efficient, certain sorting functions should be provide within Favorites menu. it can be sorted by last access date or click times. It makes the most used transaction always on the top of the list. Even the basic function like sorted by name can contribute a lot. It will help users to build up their recognition about the position.

Many new technologies have been released by SAP AG. One of them is SAP Screen Personas. According to SAP, Screen Personas enable customers to improve user experience of their specific scenarios. It works for all SAP GUI transactions. A user can personalize any transaction without programming skill in minutes. It also provides an option for Application Deliver Team to build a simpler interface for all users. They can mange different user and group profiles to reach the best productivity and reduce the cost and training time on SAP. As Figure 6.1, users can make their own interface to reduce the disturbing
information. And the best thing of Screen Personas is use can go back to default view at any time. The option ‘Basic View’ is always displayed on the main interface. So it gives a chance to user for regret

**After:** Intuitive

- Obvious where to enter data
- Pre-filled values speed process

**Before:** Overwhelming

- Too many choices
- Must memorize many numbers

![Comparison of Screen Personas](image)

*Figure 6.1: SAP Screen Personas*

SAP NetWeaver Business Client is a standard platform for all SAP business solutions. One of the key features is Side Panel. A Side panel can display additional information in a separate screen area without modifying the corresponding transaction. As *Figure 6.2*, two transactions are displaying on one screen. The deployment of Side panel can optimize the screen and reduce the operation numbers. There more options for users to choose for the side panel. The CHIPS (Collaborative Human Interface Parts) are available for chart and maps etc. as well. This is a good solution for the problem of wasting screen in SAP GUI platform.
Nowadays many smartphones apps will appear a quick tutorial when users first time launch it. This is a smart way to introduce the functionalities to users. It is compulsory for users to read the tutorial. It will improve the learnability if any quick tutorials appear on SAP as well. When the first time users execute a transaction, some simple instructions will be displayed as Figure 6.3.

Figure 6.3: An example of quick Tutorial
If this option is difficult for Volvo to implement, another one is to provide more knowledge to users. It can be achieved by spending more time on training about SAP. This one will cause some cost of money and time. It depends on the determination of each department since they are the people who pay the check.

Another way is to push the educational document as the pop-out news. *Figure 6.4* is an example of it. This is a low cost method to communicate with the users. A document will be downloaded automatically once user clicks on the dialog. However it will a bother to some experienced user. They do not want to see the pop out dialog so often. The configuration should be based on the account information to guarantee the news will be only delivered to the new employee or some one who just change the job position.

*Figure 6.4*: An example of pop-up news
7. Conclusion

The proposals that are made for this thesis are consisted of both showing ideas for making interface with user friendly and the new technologies published by SAP AG. The most important harvest for the research is the opinions of the user. SAP is a massive system, and any researcher is not able to know everything about SAP soon while the users do. Any usability project should not exclude users. The IT people should not and cannot make strategies in the office. They should visit the users and listen to their opinions since the users know their work best. A project should be iterative if the resource is enough. This will have a higher possibility to lead to a successful project.

The users of SAP application today do know how to use it. When introducing any whole new and ambitious graphic interfaces to the users, the acceptance of theirs must be taken a serious consideration. Transforming the interface step by step seems to be a better approach. And the user should be given the right to choose as well.

The simplest and lowest cost approach is introducing functions to the users. A lot of functions those are helpful for the users’ jobs are just being ignored. When a new technology is emerging, people have to look back to what they had. It wont make any value if the technology is being ignored by the real users.

Applying a usability project to a system like SAP is a massive work. It will take a very long period to harvest. The next phase for this project is to involve a small group of end user testing the new technologies. A clear communication with SAP AG is necessary as well. As the solutions provider, they have the responsibility to release software with great usability. And only they have the right to modify the code.

I wish my work with the thesis has provided useful opinions for a better usability. And may the employees of Volvo have a better work environment, which are strong supporting and high control [21].
Reference


[4] Volvo AB., "About us, " online, Last visited 20 October 2013:
http://www.volvogroup.com/group/global/en-gb/Pages/group_home.asp

[5] Volvo IT, "About Us, " online, last visited 20 October 2013:

[6] SAP AG, "About SAP, " online, last visited 20 October 2013:
http://www54.sap.com/about.html

[8] Nielsen, J., "Usability 101: Introduction to Usability," online, last visited 20 October 2013:
http://www.nngroup.com/articles/usability-101-introduction-to-usability/


Appendix 1: Agenda of interview

- Who are the end users?
- What are their goals, motivations?
- What do they concern about?
- What are their tasks?
- How do they perform their tasks? When? How often?
- Who do they interact with IT?
- How does the work environment look like?
- What equipment is needed to perform the tasks?

The procedure of interview will be:

- Introduce myself
- Ask the permission of recording the interview
  - Talk about the user’s profile
    - How long has the user been worked
    - Job title
    - How long has the user used the system
    - How often does the user use the applications in one day
    - 3 most used transactions
- Ask the user to demonstrate a typical task that is performed everyday.
  - How does the user open the system
  - How does the user access the transaction
  - The response time of the transaction
  - How does the user input data
    - Type or search?
    - How do the applications support the user (recognition than recall)?
    - Error occurred?
  - How does the application response?
  - How long does it take to finish a task?

- Interview about
  - Navigation
    - Could you always find what you were looking for?
    - Was it easy to get to the function from the screen you started on?
    - How intuitive and helpful is the navigation system?
    - Do you use hot key /t-code to operate?
      - How do you know the code
      - Why not
• Do you use the search function?
  • Does it match your expectations?
• What do you like about the navigation?
• What do you dislike about the navigation?
• Presentation
  • Was the information easy to read (both font style and size)?
  • Do you think the system talk human language
  • How do you think of the layout
  • What do you like about the presentation?
  • What do you dislike about the presentations?
• Support
  • When you find something is hard to accomplish, will you find the help document or just ask your colleague?
  • How long does it take to complete common or target tasks?
  • Do you think your productivity was improved?
• Learnability
  • Do you think it is intuitive to use?
  • Do you think your interaction with the system is clear and understandable?
  • How much time will take to be skilful for a new application
• Customization
  • Have you ever customized your system layout?
  • Do you think the system is flexible to interact with?

• Which application is your favourite
• What would encourage you to continuous to this system in the future?
• If the sap system upgrade, would you like to learn something new?
### Appendix 2: Questionnaire of SUS

1. I think that I would like to use this application frequently.  
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

2. I found this system unnecessarily complex.  
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

3. I thought this application was easy to use.  
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

4. I think that I would need assistance to be able to use this system.  
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

5. I found the various applications in this system were well integrated.  
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

6. I thought there was too much inconsistency in this system.  
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

7. I would imagine that most people would learn to use this system very quickly.  
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
8. I found the system very cumbersome to use.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

9. I felt very confident using the application.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

10. I needed to learn a lot of things before I could get going with this application.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Appendix 3: Questionnaire of ERP Usability Criteria**

1. I think that it is easy for me to navigate and access information.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

2. I think that it is easy for me to understand and comprehend the presentation of output.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

3. I think that the applications support me with works.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

4. I think that it is easy for me to initiate the applications with intuitive nature.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
5. I think that it is easy for me to customize the interface.  
   [ ] Strongly disagree  [ ] Strongly agree