Usability Evaluation of a Health Web Portal

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ABSTRACT

An effective health portal should be easy to use and understandable. A number of research studies have been taken in order to evaluate different health portals but there is no such study for ltlekeinge health portal.

A multi-phased research approach is adopted to evaluate the usability of ltlekeinge health portal. Authors conducted a usability test of the system where citizens from the county of Blekinge are taken as subjects. They evaluated the health portal on the basis of usability test and a questionnaire is prepared to know the different perspectives of citizens. The authors validated the result with the help of interviews with a number of individual.

The authors find it is very important that a health web portal should contain sufficient amount of relevant and useful health related contents. Moreover, there is need to improve ltlekeinge portal in terms of interface, contents and set of tools for accessing the ehealth services and health related information.

Keywords: Usability Evaluation, Health portal, Think aloud, Sjunet.
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CONTENTS

Abstract...................................................................................................................... 1

Acknowledgement.................................................................................................... 2

Table of Content........................................................................................................ 3

List of Tables and Charts.......................................................................................... 6

List of Figures............................................................................................................. 7

Introduction.............................................................................................................. 8

1. Background.......................................................................................................... 10

2. Problem Definition/Goals.................................................................................... 13
   2.1. Problem Definition................................................................................................. 13
   2.2. Research Question.................................................................................................. 14
   2.3. Goal and Results..................................................................................................... 14
   2.4. Expected Outcomes............................................................................................... 15

3. Methodology........................................................................................................... 16
   3.1. Literature Review................................................................................................. 19
   3.2. Selection of Usability Testing............................................................................... 19
   3.3. Criteria for Usability Evaluation......................................................................... 19
   3.4. Usability Test......................................................................................................... 19
   3.5. Questionnaire....................................................................................................... 20
   3.6. Finding after Test.................................................................................................. 20
   3.7. Feedback............................................................................................................... 20
   3.8. Evaluation of the System..................................................................................... 21
   3.9. Interview.............................................................................................................. 21

4. Theoretical Work.................................................................................................... 22
   4.1. Human Computer Interaction.............................................................................. 22
   4.1.1 HCI Standards.................................................................................................... 22
   4.2. Usability............................................................................................................... 22
      4.2.1. Why Usability is important......................................................................... 23
      4.2.2 Users benefits from usability....................................................................... 24
      4.2.3. Achievable benefits from usability for the providers................................. 24
   4.3. Usability and User Experience......................................................................... 24
      4.3.1. User Experience............................................................................................ 25
      4.3.2. User Centered Design............................................................................... 25
         4.3.2.1. The Principles of User Centered Design............................................. 25
      4.3.2.3. Web Usability............................................................................................ 26
      4.3.3.1. The General Factors Influencing Web Usability................................. 26
   4.4. eHealth............................................................................................................. 27
      4.4.1. eHealth In Sweden..................................................................................... 29
      4.4.2. County of Blekinge.................................................................................. 29
5. Empirical Study

5.1. Planning for Usability Test

5.2. Test Environment

5.3. Pre-Test

5.4. Task Definition

5.5. Selection of Participants

5.6. Test Equipment

5.7. Usability Test Conduction

6. Results/Analysis

6.1. Test Statistics

6.2. Experimental Observations

6.3. Experiment Analysis

6.4. Questionnaire Results

7. Discussion/validation

7.1 Discussion
List of Tables and Charts

Table 4.1: Overview of usability definitions……………………………23
Table 5.1: Usability Test Tasks…………………………………………43
Table 6.1: Summary of Overall Usability Test Results…………………44
Table 6.2: Summary of Task-wise Duration and its Status……………45
Table 6.3: Response of citizens…………………………………………51
Chart 6.1: Graphical representation of citizen’s response…………….53
Chart 6.2: Overall result of questionnaire……………………………53
List of Figure

Figure 3.1: Research methodology overview…………………………..18
INTRODUCTION

eHealth portal refers to delivery of information and health services via internet or related technologies [8]. Patients use these portals, to get more health information than they can have in their patient-physician relationship. Ehealth applications can be useful in providing better quality of life in a cost effective way. [9]

Usability of health web portals is an important factor in the health domain [11]. Although an increasing number of web portals are developed for this purpose but according to [11], many web portals have usability problems.

There have been many local and regional ehealth projects and programs implemented in Sweden. Currently, a number of health portals are providing health services in different counties of the Sweden [27]. LANDSTINGET BLEKINGE health portal is one of the web portals in Sweden which provides different health care services to the citizens in the county of Blekinge. Citizens can search on this portal for information about news on health care, maps and directions, county organization and activities, jobs, how to manage health, treatments and diseases, rights and obligations of the patient. Currently there are some e-services also available on this portal like “cancel appointments, renewal of prescriptions, contact with physiotherapist, book planned appointments, advice how to help you, follow-ups” etc [12].

Currently, LANDSTINGET BLEKINGE is completely available in Swedish language and some contents of portal are available in English and Dutch languages. It is very helpful to have some knowledge of Swedish language if anyone wants to be engaged in study related to this portal. Both the authors of this thesis have studied two levels of Swedish language offered at the Blekinge institute of technology (BTH). Also the authors joined the SFI Swedish for foreign immigrants since the start of thesis for having a good understanding of different terms of language. A number of worldwide translators are available which give facility to translate web pages from one language to another. Authors used two translators “Google translator” and “Systran” for translating the pages of LANDSTINGET health portal from Swedish to English language.

The purpose of this study is to explore the usability of LANDSTINGET BLEKINGE health portal and to investigate that up to which extent this portal is supporting the citizens in accessing the health care services.
This dissertation comprised of eight chapters and three appendixes. Chapter one provides the background of the topic under discussion. Chapter two describes the problem definition, aims and objective of this research work and chapter three is about the methodology adopted for thesis. Chapter four describes the literature review and theoretical work and chapter five provides details about empirical work. Chapter six presents the results based on the experiments and questionnaire and chapter seven discusses the results and its validation.
CHAPTER 1: BACKGROUND

Different authors have defined usability in a number of ways. The most common definition of usability is “the capability of a software product to be understood learned, used attractive to the user, when used under specified conditions” [15]. Usability refers to learnability, efficiency, memorability, few errors and user satisfaction. Learnability means easy to learn, memorability defines that the system should be easy to remember for users, efficiency deals how system make the users capable to perform their job. Few errors mean that the error rate is minimum in the system and can be easily repaired in case of error. Satisfaction means that the system should be user friendly so that users are personally satisfied when they use it. [14]

Usability is a key quality attribute for the success of interactive applications [1, 2, and 3]. It refers to the ease with which users can access information and navigate the web portal. Well-made portals have consistent interfaces which are easy to learn, effective to use and enjoyable from the user’s point of view [4, 5].

A web portal serves as an integrated gateway to the website and provides a single point of contact for online delivery of services to the visitors [4, 6, and 16]. Highly-useable portals are designed to search, categorize, present and to put together relevant information [4] and likely to attract a large number of hits or visitors [7].

Health information is essential for the patients to make and understand the significant decisions regarding their medical care and health status [16]. According to the surveys held in 1999, peoples seek health information very commonly and frequently on the internet [16].

Ehealth portal refers to delivery of information and health services via internet or related technologies [8]. Patients use these portals, to get more health information than they can have in their patient-physician relationship. In ideal conditions, patient can participate more actively as a member of the health care team with the help of ehealth facilities. Ehealth applications can be useful in providing better quality of life in a cost effective way. [9]

As most of the patients and health professionals use web resources for seeking information, doing research and communication, so the hospital web portals are becoming an industry standard [10].
There are different counties in Sweden. According to the national strategy for ehealth 2006, it is the responsibility of each county council to provide health and medical care to all inhabitants in the county. The planning of health and medical care must be focused on the inhabitants care needs. Private and other care providers also offer the health and medical care services to them. [20]

According to the health and medical services act in Sweden, the county councils are responsible for providing health and high standard medical care to the inhabitants of the county. The focus of the health and medical care planning must be on the care needs of the residents and the services of health and care are offered by multiple health care providers. Some ehealth projects like Sjunet and info VU are presently in progress under National Strategy (NS) for ehealth in Sweden as well as more projects are planned to start in future. [20]


“InfoVU-project -The Info VU-project which is devising classifications, quality indicators and nomenclature to be used in care documentation”. [20]

ICT based ehealth applications have been implemented in Sweden with the purpose of providing the citizens with quality of health services and better access to health care [64]. Counties have their own health web portals for providing the useful health information to citizens and health professionals [12].

There are also different web portals implemented by the counties for providing health care facilities. LANDSTINGET BLEKINGE health portal is implemented in the county of Blekinge. There are different health services available to the citizens on this web portal. The citizens access different health services electronically through the health portal. These services are “cancel appointments, renewal of prescriptions, advice before travelling abroad, contact with physiotherapist, book planned appointments, change in appointments, advice how to help you, common information, and follow-ups” [12].

Authors of thesis have worked on small projects with the health departments in the county of Blekinge during their studies. They are very well aware of working of the health care centers and hospitals in the county of Blekinge. We have sound background of health domain and interactive product development. LANDSTINGET BLEKINGE health portal was selected for current study as according to authors it is possible to provide the citizens with better access of
health information and services through this portal. It is needed that this portal should be according to expectations of the citizens and effective for the provision of health care services.

The purpose of this study is to explore the usability of LANDSTINGET BLEKINGE health portal with citizens as subjects in a usability test of the system. To perform an experiment with citizens the authors use the usability as a tool, collect their views with usability testing and get all the information with the help of questionnaires and interviews.
CHAPTER 2: PROBLEM DEFINITION/GOALS

2.1 Problem definition

The use of Internet is a major source of advice and information for health has been increasing with the time. According to a recent report on the Internet there are 70,000 health related websites available [24].

There may be a number of reasons why the people search online for health information. Some people want to be well prepared and informed before meeting the doctor, while others may be searching for support or substitute answers of their problems [25].

As the number of people consulting the Internet for health advice increases, issues related to the usage and trust come to the front. A range of information and a large number of sites available offer more choices to health consumers. [26]

Like in many other countries, telemedicine has a long history in Sweden. In 1915, the first telemedicine trial was performed in the field of remote reading of ECG signals across the campus at Lund University [27]. It advanced very slowly until 1960 after which it expanded all over the Sweden. There have been many local and regional ehealth projects and programs implemented in Sweden. Currently, a number of ehealth portals are providing health services in different counties of the Sweden [27]. LANDSTINGET BLEKINGE health portal is one of the web portals in Sweden which provides different health care services to the citizens in the county of Blekinge.

According to the national strategy for ehealth Sweden there is need of such kind of health care services which are easily accessible and provide health-related information. Citizen’s future perspective is to have personalized solutions of their problems for which they can take initiatives and make their own decisions /choices. [20]

Usability of ehealth web portals is an important factor in the health domain [11]. Although an increasing number of web portals are developed for this purpose but according to [11], many web portals have usability problems.
Different factors can influence decisions of people regarding their trust in ehealth portals [8]. At first impression the interface of the website can influence the user’s attention. For example, it is possible that the user start trusting the sites appealing visually and mistrusting the sites with poor visual designs. Secondly, the website having well-known images or well-known trusted logos may influence the users.

Currently, in the field of human-computer interaction perhaps the important goal of research is to improve the usability of these kinds of systems [28].

The purpose of this study is to evaluate LANDSTINGET BLEKINGE health portal through the usability test with citizens as subjects. This study will help to evaluate the health portal and to determine important factors regarding usability of the health web portals for its improvement for patients, health care planners and strategy makers.

In National Strategy for eHealth 2006 there is stated that, in future the citizens will require individual and customized solutions of their problems and internet will be used to learn about health care information, medicines and self treatment [20]. Therefore the current study will help for future planning of national portal like Sweden health portal. The aim of this portal is to provide health information at local, national and international level which is the updated and quality assured. [20].

This study will support the health web portal interface developers to develop an effective interaction between citizens and ehealth web portal.

### 2.2 Research Questions

Following research questions will be addressed in this dissertation.

- How can the “LANDSTINGET BLEKINGE” health web portal better support the citizens in accessing health care services?
- How is usability an issue?

### 2.3 Goal and Results

The major goal of the thesis is to evaluate the usability of “LANDSTINGET BLEKINGE” health web portal for accessing health care services. All the results depend upon the experiments that will be performed with citizens.
This study will help to evaluate the “LANDSTINGET BLEKINGE” health web portal regarding usability and it will also help to determine the influence of “LANDSTINGET BLEKINGE” health web portal on citizens in accessing the health care services.

2.4 Expected outcomes

Following are the expected outcomes of this study.

- Deeper understanding of health web portals and usability evaluation.
- Analysis of the LANDSTINGET BLEKINGE health portal by having usability test and post-test questionnaire techniques.
- Usability evaluation of LANDSTINGET BLEKINGE health portal.
- Validation of usability evaluation of the Health portal.
- Discussion on the results of the study.
- Recommendations and suggestions.
CHAPTER 3: METHODOLOGY

Methodology means “the systematic study of methods that are, can be, or have been applied within a discipline”. [13]

Methodology consists of the following steps. [13]

1. Collection of ideas, concepts or theories.
2. Different approaches of Comparative study.
3. Analysis of the individual methods.

We conduct research to find out the solution of a problem in an organized way. In order to find out the solution a research methodology will be required. There are several techniques and methods available for the usability evaluation of a system. Every method needs both practical and hypothetical skills to make sure that the selected method is the most suitable for the task [17]. It is very significant to know that collection of methods is only a tool box which helps to find the solution of required problems. The methodology selected to conduct this research is a mixed approach [13] which combines the quantitative and qualitative approaches [18].

According to Bandolier [19] qualitative research is used to explore and understand people's beliefs, experiences, attitudes, behavior and interactions. It provides non-numerical data to the user. Qualitative techniques have been commonly used to do research in health care, e.g. it can be used to document the experience of chronic illness and also to do research about the functioning of different organizations. Quantitative research gives numerical data or the data convertible into numbers. Examples of such kind of studies are clinical trials or the national census, which counts people and households. [19]

In order to understand the e-health web portal concerning usability evaluation, there will be a detailed literature review in the first phase of the study. This study will guide in selecting the appropriate methods in conducting usability tests and specifying the evaluation criteria for e-health web portal. The authors have aim to use “think aloud” technique [21] to perform the usability test of the portal and this technique will help the authors to get citizen’s point of view regarding the usage of LANDSTINGET BLEKINGE E health web portal in a better way.
On the basis of findings of usability test the authors will prepare questionnaire and interviews will be conducted. The questionnaire will play a significant role to collect such information that helps authors in evaluation part and interview is a close interaction of authors with the citizens which will be helpful for getting the quick answer to the questions that the authors ask will during the interview.

In order to evaluate the LANDSTINGET BLEKINGE health web portal and assessment of its interface, the citizens will be asked to give their point of views about a LANDSTINGET BLEKINGE health web portal. Data obtained through questionnaire will be compiled to obtain results which will be analyzed. In final phase, a number of citizens will be interviewed individually at different locations in Blekinge for the validation of results. Figure 3.1 depicts the research methodology which will be followed for thesis work.
Figure 3.1: Research methodology overview
3.1 Literature review

In the initial phase of the study a detailed literature review was done to get deep understanding and the present state of research in LANDSTINGET BLEKINGE health portal. This review helped the authors to find the solution of required problems and solve the different ambiguities regarding the techniques, methods and other tasks. First of all, the authors studied LANDSTINGET BLEKINGE health portal in depth. To evaluate the different services of LANDSTINGET BLEKINGE health portal a detailed study was required regarding usability, its role, suitable accessible techniques and methods for evaluation. To find out the relevant literature from different resources the authors adopted a taxonomic approach. The authors borrowed different books from BTH (Blekinge institute of Technology) library to get better understanding. Different search engines for instance, google scholar, BTH Samsök, ELIN (Electronic Library information Navigator) are used to search the desired material. The authors tried to consult the journals, articles, research reports, and ebooks from 2000 to 2009 by using the different database like ACM, IEEE to find out the important information.

3.2 Selection of Usability Testing

Authors used digital libraries of BTH and other resources to search the relevant data for the usability test. They found Jacob Nielsen’s book discusses the different methods and techniques for usability evaluations of different kind of applications. The authors read all the technique thoroughly and selected “think aloud” technique for the usability test of the health portal. Think aloud and why authors selected this technique will be discussed in detail in the next chapter of thesis.

3.3 Criteria for Usability Evaluation

The Authors downloaded different relevant articles by using the BTH digital library & others resources. These articles were studied to find out criteria required to define and evaluate usability issues regarding health portals.

3.4 Usability test

The authors selected “think Aloud” technique for conducting the test. This technique has been introduced by Erikson and Simon in 1984 [21]. According to them “think aloud” is a
technique to observe the problems faced by the people in performing different tasks. Four particular tasks were given to the citizens for usability evaluation. Before performing usability test the authors conducted a small face to face discussion with those people who participated in testing phase. The authors gave a brief introduction regarding the LANDSTINGET BLEKINGE health web portal to the citizens. This discussion helped both authors and participants in conducting the usability test. Users have to speak loudly what they are thinking while performing a specific task. On the other hand authors observed the user’s response and record and wrote all the observed things on the paper. The authors selected the citizens from county of Blekinge for testing purpose.

3.5 Findings after Test

Authors conducted experiments by giving four tasks to perform using “think aloud” technique. After performing these tasks authors found some valuable comments and findings from users which are very helpful to evaluate the usability of health portal.

3.6 Questionnaire

Questionnaire is an important instrument of research [22]. It is a cheapest tool since 1990 which is used to collect the data easily [14, 22]. The main function of designing the questionnaire is measurement [22]. On the basis of usability test and guidelines for usability evaluation a questionnaire was designed, after performing experiment. The main purpose of designing the questionnaire was to get the citizen’s prospective about the health portal.

3.7 Feedback

Authors used the feedback from questionnaire to know the user’s comments and opinion about ltlekeinge portal. Users from different ages and genders filled questionnaire with closed ended questions. These questions were designed to help authors in finding their relevant usability issues in health portal. After getting questionnaires filled from different citizens authors described feedback in text form as well as in a tabular form with calculated percentages.
3.8 Evaluation of the System

The authors performed some critical analysis on results of questionnaires. The portal was evaluated on the basis of questionnaire feedback and test results.

3.9 Interview

Interview is another technique which was used to gather information from the citizens on desired topic. After getting the results from questionnaire and experiments the authors conducted interviews for validation purpose with those citizens who participated in testing phase.
CHAPTER 4 THEORETICAL WORK

4.1 Human computer interaction

The study of user’s interaction with computing technology is known as Human-Computer Interaction (HCI). Today’s most important areas of research in Information Science and Library Science are HCI. The focus of HCI is on the designing for data usability and accessibility. [46]

According to the [47], “Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them”.

The goals of HCI research [47] are:
- Evaluation of existing systems
- Invention or design of new systems
- Discovering and testing relevant scientific principle
- Establishing standards

4.1.1 HCI standards

HCI standards give a precise specification about the nature of users interface. As computer technology changes these standards become out of date, and most of the work on standards is dependent on the principles which are necessary to be applied if we want that the interface which meets user needs. International Organization for Standardization (ISO) formulates the standards for HCI and usability. One of these standards is ISO 9241-11:1998 “Guidance on usability” which defines the usability in terms of effectiveness, efficiency and satisfaction. [48]

4.2 Usability

In simple words usability means that the user of a product, for example a software application, can learn that application quickly and complete the tasks easily they set out to do by using it [49]. Usability helps the workers in focusing on their tasks instead of tools used to perform the
tasks [49]. Usability applies to all those aspects of a product with which a person interacts [49]. These can be in form of documentation, training, on-line help or hardware or software, menus or icons and messages. Every design and development decision has an impact on the product's usability, made during the product cycle [49].

A usable product [49] is one which meets following criteria:

- Easy to learn
- Efficient to use
- Provides quick recovery from errors
- Easy to remember
- Enjoyable to use
- Visually pleasing

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**Table 4.1:** Overview of usability definitions [50]

### 4.2.1 Why usability is important

According to Usability Expert Jakob Nielsen, usability is a very important for the web sites to survive on the Web. People leave a web site which is difficult to use. Also people leave the web site if its homepage lacks to clearly describe about the offer presented by company and
what users are allowed to do on the web site. A web site is ignored if users lost on it. Users do not pay attention to a web site where information is difficult to read or which doesn't answer users' key questions, they leave. Users don’t like to read the web site manual or spending their time trying to figure out an interface. When users encounter a difficulty on a web site their first action is to leave it because many other web sites are also available for the same purpose. [44]

4.2.2 Users benefits from usability

Visitors can benefit from usability [44] due to the following reasons.

- Visitors will be satisfied using the web site
- Interaction with the web site will be enjoyable for them
- Visitors will attain their objectives efficiently and effectively
- Visitors will trust in the web site
- Satisfied users will become loyal and will help to recommend the product or service to others

4.2.3 Achievable benefits from usability for the providers

Usability can be beneficial for the providers in many ways [44]

- Development costs and time are minimized
- Cost for support is reduced
- Minimum user errors
- Training costs and time are reduced
- Investment return achieved

4.3 Usability and User Experience

Advancement of computer technology has provided a wide basis for studies on usability of applications. As the homes are becoming more and more equipped with the personal computers and software, concepts such as “user friendly” become very popular.

According to the literature of design, the term “user friendly” as a characteristic do design systems has attracted so much attention among academics that the friendliness between system’s users and system got the highest possible value. Today, human factor engineering
and human machine system engineering literature provides the most common perception on usability and computers [51].

4.3.1 User Experience

User Experience is a concept which gives highest importance to the end user in design and developments efforts, as compared to the system and its applications. It is shown in research that the customer’s loyalty is influenced by the efficient interaction features. Pine and Gilmore proposed that service economy is shifted to an experience economy [66]. If the users achieve his goals and is completely satisfied with the process then that will be a good user experience [67]. Existence of relationship between usability and user experience is found with evidence. According to [68] usability is measured on the base of evaluating user’s experience of interacting with the system where interface is focused.

4.3.2 User centered Design

Paradigm of User centered Design (UCD) came to front as a result of importance of user experience in development process. UCD are the principles proposed by Gould and Lewis [53] and are documented in ISO 13407 [52]. According to [55] UCD attempts to produce user oriented products. This is achieved by focusing on the user needs during all the processes of design and development. According to [54] only those products increases user satisfaction and productivity, and reduce training costs which fulfill user requirements.

4.3.2.1 The principles of User Centered Design

Following principles are advised by Gould and Lewis [53] when designing for usability:

- Early focus on users and tasks
- Empirical measurement
- Iterative design

Second principle stress on the importance of testing and validating design decisions in the process with users using the prototypes ‘that will use the system later. Iterative design means that process of design, test, measure and redesign should cycle as much as needed Gould and Lewis [53]. These principles are still valid today and are also reflected in principles incorporating the user-centered approach in interactive system design. According to ISO [52].
• Active users involvement and users and task requirements should be clearly understandable
• Proper distribution of the functions between technology and users
• Repetition of design solutions
• Design should be of Multidisciplinary nature

In both lists the first principle is very similar. ISO 13407 [52] also stresses that at early stages of design, involvement of users should be present. Also the iterative aspect of design solutions is present in both recommendations. Principle of “appropriate allocation of function” describes that which tasks the system should perform and which the user should perform. Principle of multi-disciplinary design recommends the participation of those people in the design that has different skills and viewpoints.

4.3.3 Web Usability

With the passage of time, web site usability and design has attracted much attention in the fields of human computer interaction (HCI) and web-specific usability research. World Wide Web a vast sea of information connects people via the internet and makes millions of web resources accessible for them. This vast sea of information is growing day by day and millions of new web pages are added daily, many of these are designed and developed by the people who give little attention to the fact that how this information will be used and who will use. It would be very beneficial to provide guidelines and frameworks for making the pleasing user experiences in such environment. As web site is a primary user interface for internet enabled business (Straub and Watson 2001), information provision and promotional activities, the assessment of what users demand in a web site is a significant study area.

4.3.3.1 The General Factors influencing Web Usability

With the increasingly popularity of World Wide Web, the web became an essential interface as a result of which the focus of usability research is increased on extending the basic usability principles into web environment [14,65]. According to [14] extended the design principles for web design to include:

• Navigation
• Response
• Time Credibility
• Content
These principles recommends that navigation should be easy to use, there must be frequent updating, download times should be minimum, it should be relevant to users, and containing content of high quality with capabilities unique to the online medium [14]. Navigation allows users to get more information they are looking and it makes easy to find that information [57]. In building a web site, a key challenge is to create good links and navigation mechanisms [61]. In order to make the page easy to use the graphical design, layout and actual contents are major parts [60]. According to (Spool, 1997) in a Web site, text links are very vital, content and navigation are inseparable, navigational structure, searching, readability and graphics are key areas.

In literature, research has been going on for identifying approaches which can improve the ease of use of the web [59]. The focus of web users is always on download delay, success in locating a page and arrangement of gathered information in the web session [56]. A web site which claims to have high usability should generate a pleasing view of its use and of the purpose to use the site [58]. Web site usability includes the features of consistency, ease of reading, ease of getting the web site according to the user’s intentions, clarity of interaction, arrangement of information, speed and layout. A suitable user interfaces design includes organization, presentation and interactivity [65].

**4.4 eHealth**

As the focus of providing the health services transferred from doctors to health professionals, telehealth develop gradually from telemedicine [29]. In broader sense ehealth covers both telehealth and telemedicine [30]. Ehealth implies the availability of health information, support and services to people, health workers and others via internet [31]. The aim of the consumer health informatics is to provide the health information to consumers as well as to integrate their first choices into health systems [32].

Ehealth systems have three models. According to the first, “*the traditional medical model*”, [33] information flows from a medical authority to a passive patient. In the Second, “*healthcare consumer model*”, patients themselves are responsible to search for health information, while the last, “*information sharing model*”, states that the information flow is in both directions between a health professional and patient. So the provision of health information electronically, where the consumers search for it and internet provides it is the second model of the ehealth systems.
People need health information to understand their health status and to make significant decisions about their medical care [33]. Health providers and other groups have been performing the decision-making function in the health area in the past [34]. As a result of the rising importance on facilitating patients in making informed decisions, the patients have recently started to take this role of decision-making function [33]. Assisting health service consumers to access health information is advantageous for them and enables them to make informed decisions. Consumers will be more effective to understand their healthcare provider and implement their instructions, when they will have accurate health information [35]. Studies have revealed that the patients with chronic illnesses have improved health, their behavior changed to health-promoting manner, where they have access to health information [36].

A frequently appeared category of E-health systems, health portals, enables the provision of health information. A portal is a website offering a set of services which assist people to navigate the internet [37]. Along with the access to health or related information, portals can also provide a range of other services to the users. Search facilities, community-building utilities, access to commercial offerings and personal productivity applications are common services offered through portals [38]. A large number of visitors are likely to be attracted by the effective portals and visitors spend more time on them [37].

Websites estimated to provide health information are some of the most heavily used sites on the internet [39]. As a result of the large number of health websites, many concerns have been expressed regarding the quality of available health information on the internet.

In order to solve the problem of quality some recommendations have been presented that it is responsibility of health professionals to direct their consumers towards quality health information [40]. However, it can be a difficult task to check the quality of health information websites.

Few professionals have done studies to evaluate health systems [41, 42], while the empirical or theoretical literature is missing and only speculative literature is available [30]. Therefore, it is needed that various aspects of these systems should be assessed as well as methods of doing so. As there are many competing health websites and portals available, and mortality rate of portals is growing higher [37], and portals quality and its perceived “success” are of significant interest.
Success can be interpreted as a measure of how much favorable the outcome of the portal is, while the quality can be seen as characteristics that satisfy explicit and implicit needs [43]. So there is a need to identify reliable and relevant health information.

### 4.4.1 eHealth in Sweden

According to the Health and Medical Services Act in Sweden, the county councils are responsible for providing health and high standard medical care to the inhabitants of the county. The focus of the health and medical care planning must be on the care needs of the residents and the services of health and care are offered by multiple health care providers. Some ehealth projects like Sjunet and info VU are currently in progress under National Strategy for ehealth in Sweden as well as more projects are planned to start in future. [20]


“**InfoVU-project The Info VU-project which is devising classifications, quality indicators and nomenclature to be used in care documentation**”. [20]

ICT based ehealth applications have been implemented in Sweden with the purpose of providing the citizens with quality of health services and better access to health care [64]. Counties have their own health web portals for providing the useful health information to citizens and health professionals [12].

### 4.4.2 County of Blekinge

Blekinge one of the county councils in Sweden with 152,000 inhabitants, is among the most densely populated counties with 51 inhabitants per square kilometer. The land area is 2,941 square kilometers and there are five municipalities namely Karlskrona, Ronneby, Karlshamn, Sölvesborg and Olofström. Medical services are close at hand in Blekinge and it has a well-developed system of healthcare and medical services with primary healthcare as the base. There are plenty of healthcare centers and district nurse clinics which are integrated with the county’s private healthcare providers. In both Karlshamn and Karlskrona, there are county hospitals, Blekinge sjukhuset. IT development is especially emphasized in the county, a few examples of which are telemedicine, digital image handling of x-rays, and extensive journal and information systems. [12]
Citizens want to interact with health care services in multiple ways, they need health related information which is easy to access. Citizen’s future prospective is to have individual personalized solution of their problems, take initiatives on their own and capable of making their own choices. [20]

Blekinge county council offers a number of health care services to its inhabitants. Work for the good of public health in Blekinge is oriented towards strengthening the health determinants positively, such as social networks, good habitat and opportunity for participation. The County Council is working with health squares in the county and the network of a health promotion school. Other important partners in public health work are, for example, the municipalities, the provincial government, industry and various associations. Public health institute's website gives information about the objectives and the national public health goal. [12]

4.4.3 Landstinget Blekinge

The county of Blekinge has implemented a web portal named “LANDSTINGET BLEKINGE, www.ltblekinge.se” for its citizens, which gives them access to the different health related information and services. Every year at least three theme days are arranged which provides information to the county residents on health and diseases. Information about these days is advertised on this web portal and in newspapers. [12]

Parents, children, youth, women, men, mature, disabled and old people are individually focused on this portal. It gives information about Health and care. People can find information on self care, fitness, health centers, hospital and psychiatric care on this web portal. It also helps citizens to search information on the county's dental care. On this portal they find useful information that may be useful to know in their contact with health care, for example, how the health system works, information on trips to health care, patient tray and more. People can get help in the A-Z of services about the words and concepts in health care that they do not understand. Information on the political governance, the County Council's organization and how it works with the health department is also available on this portal. [12]

Overview of some of health related services available on this portal is as follows.

Most common diseases such as cardiovascular disease and cancer, is part of our lifestyle. Clinics, family doctors, occupational or district physiotherapists can advise on how to live healthy. Through this portal, among other things citizens can get information about eating
habits and diet, weight problems, how to exercise, stress, smoking, alcohol, Allergy, sleeping habits, how you feel and how your health in the future. [12]

Physical activity can be anything from walking to swimming, golf or dancing. Much information is available for physical activity on the Ltoblekinge web portal. It is prescribed on prescription in the same way as drugs. Regular physical activity has many healthy effects on body and mind whether you're healthy or sick, old or young. Regular physical activity can prevent you from illness and improve your health if you have a chronic disease. [12]

Interest in self has increased and many ailments can take care of itself. There is much information about the self that people can search. Here are some examples: [12]

- County website contains advice on how to take care of your health and self-treat simple ailments.
- Medical Advice has gathered under the heading Self wizard. Under the heading Life and health, you can read about what is important for the well-being.
- Health the squares are venues where you can get advice on self care of including pharmacists and district nurses.
- Hospital library has a special section with health information aimed at patients and families.

If you are planning a trip to tropical countries, you may need to vaccinate you, because the risk of infectious diseases is greater. The portal also gives information about what type of vaccination is needed and tips on what you should think about before the trip. [12]

Some of the health care information is to provide you with the medicines you need. People can read about the usage of drugs and also read about how much the citizens have to pay for the medicine per year before having the free medicine. It also guides about what do with leftover medicines. [12]

Ltoblekinge provides a hyperlink to web site www.1177.se. People can visit this web site and can have advice on their problems. It contains lots of facts and advices about the health problems. On this web site citizens can among other things, read on following: [12]

- diseases, injuries and symptoms
- examinations, treatments and medicines
- pregnancy and childbirth, parenting and child
- health and well-tips
- how to deal with difficulties and crises
- how the healthy body looks and works
- rights and obligations of patients and healthcare professionals

This portal also provides people access to some eHealth services in the county of Blekinge.

4.4.3.1 eHealth Services

According to Petra Wilson, a wide range of health care services and health information are covered by eHealth [63]. Currently, total nine eHealth services are being offered by the LANDSTINGET BLEKINGE web portal at certain clinics in Blekinge and eHealth services available at different clinics are not necessarily the same. Following sections provide an overview of eHealth services at LANDSTINGET web portal. [12]

4.4.3.1.1 Recipes Renewal

It is possible to renew some prescriptions via the website and/or on phone. The charges to renew the recipe are 60 crowns for the citizens via the telephone or on the website.

4.4.3.1.2 Cancelling the Visit

The visits can be canceled through telephone and on internet 24 hours before the visit otherwise the citizens have to pay the visiting fee.

4.4.3.1.3 Book Visit

Citizens can also book the appointment for their visit to the doctor on telephone and via the internet. Booking facility on telephone is available from Monday to Friday and on internet from Monday to Tuesday.

4.4.3.1.4 Ordering Certificates

If any citizen wants to order the certificates, he or she can do this via the internet or by personally visiting the hospitals. The certificates are sent by post.
4.4.3.1.5 Travel Vaccination

Landstinget web portal provides the important information about the vaccination needed for traveling for instance which type of vaccination is required for specific areas. Information related to the any vaccinations previously taken and time of reception may be asked.

4.4.3.1.6 Universal Access Card

There are three types of universal access card e-services are available to citizens: “Universal Access Card asthma”, “Universal Access Card diabetes” and “Universal Access Card stoma”. [12]

4.4.3.1.7 Self-Referral to Physiotherapy or Occupational Therapist

This service enables the patients to support them in managing their daily work activities such as dressing, living, cooking etc. Blekinge county council gives the citizens benefit of Referral to Physiotherapy service for their well being.

4.4.3.1.8 Ask the Doctor

This service helps the citizens to know important things about their illness. Through this service citizens can ask their doctor about medicines they are using, sensitivity to any type of medicine or its side effects, type of foods they can take, type of their illness and how long he or she is effected by the disease etc.

4.5 Usability Evaluation of health portals

To evaluate the usability of health portals number of study have been conducted. The National Institute (NI) has conducted a study to assess the usability of one hundred and twenty web sites which were offering the health resources based on aging web guidelines. NI assessed the translation, performance and reading complexity. The results from assessment shows that many sampled sites were not senior-friendly and several containing non- translated text and 12 % of the sites offered a Spanish version. [69]

Yin-Ling Theng and Eng-Soon Soh investigated the online trust of health care web portals in Asian countries. To evaluate these portals a web based survey was conducted through the internet and achieved 127 responses. According to the results of this study a significant
relationship is present between usability and perceived credibility of healthcare web portals. Both healthcare web portals found violating the “error prevention” usability heuristics. [70]

As a result of advantages offered by the health care web portals the number of people seeking for online healthcare and medical information is increasing but it is still a problem for the consumers to decide which site is credible and which one to trust [70].

A researcher’s group from Consumer Web Watch, Sliced Bread Design and Stanford University’s Persuasive Technology Lab studied the credibility of healthcare web portals from consumer’s prospective and from the health and finance experts. They found that consumers were relatively influenced more by the overall visual appeal of the sites while the healthcare experts emphasized more on the name reputation of the sites, site operators or affiliates, information source and company motives. They suggested that in the absence of expertise, the consumers tend to evaluate a site’s credibility based on looks and ease of use [71]. CS. Lee, et al also evaluated the healthcare portal based on credibility evaluation [72].

The University for Health Science, Medical Informatics and Technology (UMIT) organized an exploratory workshop on “New Approaches to the Systematic Evaluation of Health Information Systems (HIS-EVAL)”, in Innsbruck, Austria, in April 2003 with sponsorship from the European Science Foundation (ESF). The purpose of this workshop was to identify and address the frequent problems of getting evaluation understood and recognized, to promote trans-disciplinary exchange within evaluation research and to promote European cooperation [73].

4.6 Usability Evaluation: Methods and techniques

Usability evaluation is normally performed to analyze the issues related to the usability of a system. Its purpose is to test the system for users and to measure how much it is resourceful and effective in satisfying the users while they interact with it. At each step of the software development process it gives us feedback. When a system is developed for an organization, there might be a number of requirements for the system and to fulfill these requirements different approaches can be used. But there are a number of risks despite best practices are used to develop the required system. It might be possible that users do not feel it easy to learn or use and might not be satisfied with its usage. Usability evaluation helps to identify and realize the problems during the development process. It is helpful in understanding what main causes of these problems are and in making changes to correct these problems. [74]
In broader sense usability evaluation is categorized into two types namely analytic and empirical evaluation. Analytic evaluation deals with modeling and analysis of system’s features and what are its implications of using the said system. In empirical evaluation we use observation or other data collection methods from system users during the evaluation of the system. [74]

The authors of this thesis decided to conduct the empirical evaluation of the Landstinget health web portal. Selection of appropriate techniques for investigation is very important during the evaluation process. Authors selected techniques such as think aloud, observation, questionnaire and interview to conduct thesis work.

Think aloud technique with its advantages, disadvantages and why this technique was selected for the usability test in this thesis is explained in the following subsections.

4.6.1 “Think-aloud” method

“Think aloud” technique is a type of outsider observational analysis. As its name suggests, the method involves users vocalizing their thoughts and actions as they perform a set of specified tasks. Users are instructed to speak what they are thinking and feeling while doing a task.

The main advantage of “think aloud” technique is that it permits observer to watch the process of task completion. The occurrence of silence during the evaluation is the major problem with think aloud analysis. The observer doesn’t have any idea what the user is trying to do or what the user is thinking in his mind. A way to handle this problem is that the observer can prompt the user to think aloud, however this may be seen as overbearing. It may also exacerbate the problem associated with “think aloud” analysis. Also it is difficult for the participants to speak aloud all of their thoughts and actions. One solution to this problem is that the “think aloud” analysis to be conducted in pairs or even groups. [62]

4.6.1.2 When can the think-aloud method be used?

We can apply the “think aloud” technique throughout the development and design process. This method is mainly useful for examining the prototypes, highlighting the possible problems from a user point of view. The technique has also been shown to be very effective when evaluating systems intended to be used simultaneously by different users. [62]
4.6.1.3 How to conduct a think-aloud analysis

There are four broad stages of “think aloud” analysis

4.6.1.3.1 State the aim and objectives of the evaluation

In evaluation of any system, the first step is to identify the aims and objectives of the study that what we are going to do. This will help to recognize the user activities that require evaluating. [62]

4.6.1.3.2 Define the tasks

Once the aim and objectives has been defined, the next step is to develop the specific tasks for the evaluation. It is very important to define the entire task clearly. This will help the participant to keep focus on the goal and thus the process involved in achieving that goal. It may also be useful to divide complicated tasks into subtasks, so that more detailed information about each task can be gathered. [62]

4.6.1.3.3 Conduct the evaluation

Once the tasks are identified, aim and objective are also set; it is a time to perform the evaluation. Participants involved should represent the general population so that representative data is collected. [62]

Before starting the evaluation it is very significant to give a brief introduction to the participants regarding the system. A demonstration of the “think aloud” technique should be given and participants should carry out an unrelated practice task. It is also very significant to remind participants that they should vocalize their thoughts and actions while performing the task. It may also be needed to prompt the participants from time to time during the evaluation, if they remain silent for too long. [62]

At the end, observer should make sure that the participants understand the plan of the evaluation, so that their judgment and observations are not affected by comments unrelated to the task. Observer should also avoid the temptation to prompt the participants, even if their actions appear to be moving off task (which may be the case with group think-aloud evaluations). Only intervene if the task has finished or the task has clearly broken down
beyond any further progress or a participant is clearly exhibiting a strong desire to end the evaluation, but is reluctant to say so. [62]

4.6.1.3.4 Data analysis
Data can be collected in video and audio format. When analyzing the data, try to avoid supplement notes with subject’s comments based on recollections from the evaluation. Supplementary notes should be used to take help to clarify the actions and comments from the users, not evaluators’ opinions. Once the analysis of individual user’s data has been completed, the next step is to aggregate the data to identify common themes running through the evaluations. [62]

4.6.2 Advantages & disadvantages of the think aloud evaluation method
Following are the advantages and disadvantages of “think aloud” [62] is

Advantages

- Provides rich qualitative data
- Allows first hand insight into the thought processes associated with different tasks.

Disadvantages

- Participants are often resistant to verbalize problems
- Difficult to identify changes in behavior due to learning
- Techniques only work as long as the subject verbalizes their actions

4.6.3 Questionnaire

Questionnaire is an inexpensive tool which is normally used to collect data from large number of people. It plays a very significant role for usability evaluation of the system. According to the [23], questionnaire is a well known technique to gather demographic data and user’s opinion.

There are two types of questionnaire ‘open’ or ‘closed’. Closed questions are not very difficult and quicker to answer, they required no writing and it is simple to quantify the results. The respondents are allowed to choose from alternative replies in closed ended questionnaire. They
may be asked to tick or underline their chosen answer in a written questionnaire. Questionnaire of this kind may offer simple alternatives such as Yes or No. Choices of any kind are not given after open ended questions, and the answers are fully recorded. In written questionnaire case, the space or number of lines available to give the answer will partly shows the length and completeness of the responses we obtained. The key advantage of the open question is the freedom it gives to the answerer. Once they understand what is asked in the question, they can think freely and give a range of suitable replies. Questionnaire provides a lot of advantages to the evaluator; the major benefit is that it gives more understanding to the surveyor regarding the topic. [22]

4.6.4 Interview

A common technique for evaluation and validation of the usability test of a system is interview. In this technique, human factors engineers make questions about the product based on topic of interest. Then the interviewer asks these questions to the users in order to collect the required information. Interview is beneficial to obtain the detailed information as well as information which are achievable only during the interactive process between the user and the interviewer. In the evaluation phase interviewer asks the questions to the users and the verbal replies from the users are recorded. This technique includes unstructured interviewing and structured interviewing. [45]

4.6.4.1 Unstructured interviewing

This technique is used during the prior stages of usability evaluation. The objective at this stage for the investigator is to gather all the information concerning the user’s experience. In this method the interviewer has no concerns with any particular aspects of the system and also does not have well defined agenda. The main objective is to gain information about the procedures which users adopt and what they are expecting from the system. [45]

4.6.4.2 Structured interviewing

This technique has a specific, predetermined agenda with precise questions to guide and direct the interview. Normally, structured interview is about closed ended question is just like an interrogation as compared to unstructured interviewing, which is similar to a conversation. [45]
4.6.4.3 Common guide line for conducting interview

Following guideline should be considered during the interview.

- Avoid asking difficult question during conducting the interview
- Avoid asking too many questions
- Use clear language
- Divide complex questions into simple questions
- Be attentive during the interview.

The authors will ask open ended and closed ended questions in the interview to a number of individual citizens to validate the results of usability evaluation.
CHAPTER 5: EMPIRICAL STUDY/CASE

5.1 Planning for usability Test

The authors planned at the initial phase of research to evaluate the system using with usability test. Usability test was designed in such way that it can evaluate the system in an effective way. The authors studied relevant literature to find out the most suitable technique. Authors found “think aloud” technique best suitable for conducting for usability test of LANDSTINGET to know citizen’s perspective about the health portal in better way. This technique has discussed in detail in chapter 4.

In the second phase it was planned to conduct a test with individual subjects. The authors selected a number of subjects from the different locations of County of Blekinge. All the subjects were male and have same culture background. The authors made an appointment with all the subjects before conducting the test.

5.2 Test Environment

The authors selected the university group room for usability test in a controlled environment where same machine, connection speed and web browser were used for getting the better result. The authors booked the university group room before conducting the test. The reason of selecting the university group room was that, the authors wanted to provide a peaceful environment to the participants and the group room is the best place for usability testing from author’s point of view. The authors fixed the entire instruments after checking prior to perform the test which was used in usability test. The participants performed their tests in quiet environment on same machine. Recording camera was used by authors during the experiment for recording experiment.

5.3 Pre- Test

Before conducting the actual experiment on the LANDSTINGET health portal, the authors conducted pretest in order to get maximum information and data. The purpose of conducting this test was to make sure that subjects feel no difficulties to understand all steps of each task and these tasks were defined properly as given in table 5.1. The authors selected two Swedish
citizens randomly who were familiar about this application. The authors observed and made notes while the applicants were performing the test. Tasks were updated according to the feedback obtained. This pretest helped the authors to make the task description simpler.

5.4 Task Definition

Four tests were given to the participants in order to execute the usability test. The following tasks were defined which cover key features of the system.

- Locate a nearby clinic and the doctor for the dental problems.
- Get medical advices using self wizard option.
- Locate the desired ehealth services.
- Book appointment of a doctor.

5.5 Selection of participants

Since LANDSTINGET health portal is in Swedish language so only those citizens were selected for usability test who know the Swedish language very well. Fifteen citizens participated in the usability test and all of them are able communicate in both Swedish and English languages very well. There were no constraint of gender, either applicant is male or female but all the participants were male. Five applicants have used itblekeinge portal before but remaining ten were not familiar about this health portal. So five applicants are advance users and ten were new users.

5.6 Testing Equipment

Dell laptop was used in usability test with predefined settings. Same environment was provided to the subjects. Microsoft Internet Explorer and Mozilla Firefox web browsers were available to access the health portal. Friendly atmosphere was created to perform the test. The authors also used voice recorder for audio recording purpose while subjects were performing the usability test and vocalizing their thoughts.

Dell system was used for usability test. Specifications of the laptop are given below.

Dell studio, Intel Core 2 Duo, 2.00 GHZ, 250 GB, 3 GB RAM, Windows VISTA
5.7 Usability test conduction

“Think aloud” technique was used for usability test. The participants came for usability test at their convenience and every participant was briefly explained regarding the “think aloud” technique before starting the test. As many applicants used ltlekeinge portal first time, so authors decided to give a brief introduction to the participants to become familiar with the portal. After that a brief overview about the portal, purpose of test and tasks were discussed with each applicant. This session took around five minutes with each participant. The authors gave the tasks list to the participant for performing the usability test on ltlekeinge portal. On the other hand authors observed the participant’s behavior and attitude toward the system and write down the important points while subjects were performing the usability test. The authors noted the starting and ending time of each subject for completing the tasks. The authors used the recording camera with participant’s prior permission for usability test. Table 5.1 gives details for each task of the usability test.
Table 5.1: Usability Test Tasks

**Task 1: Locate a nearby clinic and the doctor for the dental problems**

1. Explore different tabs to find the information about the nearest available clinics and doctors.
2. Click on the Dental ("Tandvård") tab.
3. Search through the different options to locate a nearby clinic and care services available at the specific clinic.
4. Search for a specialist for your specific problem.
5. Explore the other ways to perform the same task.

**Task 2: Gets medical advice using self wizard ("Egenvårdsråd") option.**

1. Click on the tab "Hälsa och vård"
2. Click on the "Hälsoråd och sjukdomar" in the menu appeared on the left side of page.
3. Click on "Egenvårdsråd" (Self care) in the detail pan.
4. Identify your problem, its symptoms and get the advice by using the different options available.
5. Explore the other ways to perform the same task.

**Task 3: locate the desired ehealth service.**

1. Visit https://www.ltblekinge.se to search for the ehealth service.
2. Click on “Till sidan med alla e-tjänster” in the “Gör det själv” dialog box.
3. Identify your desired e-service.
4. Locate the health center which is offering your desired e-service.

**Task 4: Book appointment of a doctor**

1. Click on “Till sidan med alla e-tjänster” in the “Gör det själv” dialog box.
2. Locate the clinic where you want to book appointment.
3. Click on book appointment.
4. Fill in the required fields for the appointment to a doctor.
CHAPTER 6: RESULTS/ANALYSIS

This chapter discusses and elaborates the results derived from analysis of collected data from citizens with usability evaluation methods. Two different results are presented in order. The results of “think aloud” (TA) technique are presented first, other results are derived from the questionnaire. Section 6.1 shows overall statistics of the test. Section 6.2 describes the observations regarding each task and section. Section 6.3 gives analysis on the basis of these observations of section 6.2. Section 6.4 present the results of questionnaire.

6.1 Test Statistics

Fifteen citizens participated in the usability test to perform the tasks. The author recorded the participant’s comments during the test using “think aloud” technique (TA). The author divided the participants into two groups. Five participants are in advanced users group and ten users are placed in the second new users group. Table 6.1 gives the summary of results of both phases of usability test with minimum, maximum, and average time spent during each phase. There are big differences between minimum and maximum time for completing tasks by the subjects. There are two main reasons of this difference in the author’s opinion. First reason for this difference is due to difference in subject’s experience and second reason is variation of interest for performing the given tasks.

<table>
<thead>
<tr>
<th>Testing Phase</th>
<th>No. of Subjects</th>
<th>Average Time (minutes)</th>
<th>Minimum Time (minutes)</th>
<th>Maximum Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>2</td>
<td>38</td>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>Post-test</td>
<td>13</td>
<td>35</td>
<td>25</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 6.1 shows details of results for each task which includes total duration of test, duration for each task, and status of each task. In Table 6.2, “C” shows the completion of task whereas “U” represents uncompleted status of the task.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Subjects</th>
<th>Total time (Minutes)</th>
<th>Task 1 (Minutes)</th>
<th>Task 2 (Minutes)</th>
<th>Task3 (Minutes)</th>
<th>Task 4 (Minutes)</th>
<th>Status</th>
<th>Status</th>
<th>Status</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>1</td>
<td>41</td>
<td>9</td>
<td>11</td>
<td>8</td>
<td>13</td>
<td>C</td>
<td>U</td>
<td>C</td>
<td>U</td>
</tr>
<tr>
<td>Pre-test</td>
<td>2</td>
<td>35</td>
<td>7</td>
<td>11</td>
<td>7</td>
<td>10</td>
<td>C</td>
<td>C</td>
<td>U</td>
<td>U</td>
</tr>
<tr>
<td>Post-test</td>
<td>3(Advance)</td>
<td>30</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>9</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>U</td>
</tr>
<tr>
<td>Post-test</td>
<td>4(Advance)</td>
<td>31</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>C</td>
<td>U</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Post-test</td>
<td>5(Advance)</td>
<td>25</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>U</td>
</tr>
<tr>
<td>Post-test</td>
<td>6(Advance)</td>
<td>27</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>9</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>U</td>
</tr>
<tr>
<td>Post-test</td>
<td>7(Advance)</td>
<td>29</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>C</td>
<td>C</td>
<td>C</td>
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</tr>
<tr>
<td>Post-test</td>
<td>8(New )</td>
<td>35</td>
<td>10</td>
<td>8</td>
<td>4</td>
<td>13</td>
<td>C</td>
<td>U</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Post-test</td>
<td>9(New )</td>
<td>33</td>
<td>6</td>
<td>8</td>
<td>7</td>
<td>12</td>
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<td>U</td>
<td>C</td>
<td>U</td>
</tr>
<tr>
<td>Post-test</td>
<td>10(New )</td>
<td>39</td>
<td>10</td>
<td>9</td>
<td>6</td>
<td>14</td>
<td>C</td>
<td>C</td>
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<td>U</td>
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<tr>
<td>Post-test</td>
<td>11(New )</td>
<td>43</td>
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<td>10</td>
<td>10</td>
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</tr>
<tr>
<td>Post-test</td>
<td>12(New )</td>
<td>41</td>
<td>8</td>
<td>11</td>
<td>12</td>
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<td>C</td>
<td>C</td>
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<td>U</td>
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<tr>
<td>Post-test</td>
<td>13(New )</td>
<td>37</td>
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<td>U</td>
</tr>
<tr>
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<td>14</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>U</td>
</tr>
</tbody>
</table>
6.2 Experimental Observations

6.2.1 Task 1

In this task subjects are provided with few steps to explore different options and search for a nearby doctor and clinic. This task was selected to familiarize the subjects with the system and its features. Author’s observations during the task are as follow.

- It is easy to find search for a doctor and clinic.
- Many subjects were confused while exploring the different tabs to locate a doctor and clinic due to lot of information at the main page of the portal.
- Almost all the subjects successfully performed the task.
- Many subjects prefer to use the “Finding the right direct” option available at right side of the page to search for a doctor or a clinic instead of exploring the different tabs and options.
- Some subjects were confused that how and where to find the alternatives for performing the same task.

6.2.2 Task 2

In task 2 subjects are requested to search for medical advice on self care and to read about the injuries and symptoms and how diseases can be treated. During this task following are observations:

- Subjects easily reach at the desired page of self diagnosis after following the given steps.
- Most of the subjects were confused while using the options available at the self diagnosis/wizard page while searching information about their problem.
- Information at the self diagnosis/wizard page is almost in the text format and not in the proper form which confused the subjects.
- Subjects expect graphical presentation of steps instead of long text pages.
- Many subjects were confused to find the alternative ways for performing the same task due to lack of helpful information. Some of them use the search option for this
purpose and locate it successfully. Most of them couldn’t see this option in the tab “A-
Ö om vården”.

6.2.3 Task 3

Task 3 is about locating the desired ehealth service and health center which is offering that
ehealth service. Subjects are required to search the health center from a list of available health
centers with desired health service. Author’s observations during the task are as follow.

- Almost all the subjects completed this task successfully.
- Subjects look for “Till sidan med alla e-tjänster” option in the “Gör det själv” dialog box on main page.
- After clicking on the “Till sidan med alla e-tjänster” option subject expect more
visible links for available ehealth services and respected health centers.
- Subjects expect that all the given e-services are available for them.
- Subjects become confused when they came to know that all the e-services are not
available at every health center.
- They expect the e-services options as links so that they can click on and go for getting
the desired e-service but it created confusion for them when they can not find that.
- Subjects do not like to go to each health center for checking the available e-services.
- Some subjects feel it boring and withdraw the task

6.2.4 Task 4

In this task the subjects are requested to book the time online for the appointment of a doctor
using the e-services option. Subjects are given some steps to perform this task. Author’s
observations for this task are as follow.

- Subjects use “Till sidan med alla e-tjänster” option in the “Gör det själv” dialog box
to search for e-service of booking the time for a doctor.
• Subjects get confused when they come to know that “booking the time” is only available at specific health centers.

• Many subjects get confused at the first page of the “booking the time” e-service. Information available to help the subjects for using different available options is not clear. Subjects are not satisfied with the available Information to fill in the different boxes.

• Subjects couldn’t fill the choices properly for time booking and as a result couldn’t successfully use this e-service.

6.3 Analysis of test results

In the usability test of landstinget four tasks are defined which introduce the subjects with the main features of the landstinget. For conducting the usability test authors used think aloud technique. While the subjects were performing defined tasks, notes were taken by the authors along with the audio recording to analyze it later. Above mentioned observations (in Section 6.2), subject’s comments and their body language during tasks performing are helpful in the analysis of the health portal. Following sub sections describes the author’s analysis for the evaluation of the system which will help in designing the questionnaire.

6.3.1 Merits of the Landstinget

Citizens are pleased with the idea of the landstinget health portal for accessing the health related information and health services at their own. Although citizens are not satisfied with many features of the health portal yet they like few features. Subjects liked the search feature present on the main page because it is visible and subjects find it very easily.

Landstinget health portal is very simple to use and having the relevant information so and users do not feel difficulties in using the health portal. Citizens can access the health related information and other services without much effort. They can get information about the different clinics, opening hours and addresses from the portal.

Citizens liked idea of e-services like booking visit for a doctor, canceling the visit, recipes renewal, ordering the certificates, travel vaccination, universal access cards, self-referral to physiotherapy, self-referral to occupational therapist, ask the doctor on the web portal. This
will save their time of going to hospital and getting these services. Also it makes them more capable of taking decisions at their own.

Getting information about diseases like symptoms of different diseases, its treatments and advice on self care is appreciated by the citizens. They want to have update information about their health problems. This will make them more confident about their health.

6.3.3 Demerits of the Landstinget

Citizens are not pleased with structure of the main page because it is unnecessarily massive. It should be simple having only those contents which are extremely important. Quick links, featured pages, and headings along with the contents or links to other pages should be eliminated from the main page.

Citizens are not satisfied with contents and the available health related information for diagnosing the health related problems and how to cure these diseases. Also they have doubts on the quality of health information because no information is available about the authors of this information. This decreases the trust of citizens on the health portal.

The layout of page which is providing information about the symptoms of different diseases, its treatments and advice on self care is very poor. It contains long text instead of graphical representation of health information. Procedure of advice on self care is also not pleasing and attractive for the citizens.

Help pages at the health portal are heavily stuffed which is not liked by most of citizens. They do not want to spend their time while reading lengthy descriptions. Citizens expect more elaborated screen tips for performing the different activities. Also icons used on different pages are not very attractive and meaningful.

Generally, health portals use multimedia contents to demonstrate different health related activities in health domain but currently the Landstinget health portal have no support for the audio and video multimedia contents which makes it less interactive and effective for the citizens.

Observations shows that while performing different operations during the usability test appropriate warning or error messages are not provided by the Landstinget. Messages displayed are not elaborated regarding the specific operations. e.g Many subjects get
confused at the first page of e-service “booking the time”. Information available to help the subjects for using different options available on this page is not clear. Subjects are not satisfied with the available information to fill in the different boxes.

Only some parts of landstinget health portal are available in languages other than swedish. As many citizens living in Sweden are not Swedish which makes it less useful for all the citizens. Landstinget health portal should also be available in languages other than swedish in order to cover a large number of citizens. Availability of portal in English langugae can also prove useful for the non-swedish speaking citizens.

According to citizens, the layout of ehealth services page is not very helpful and visible e.g. They expect the e-services options as hypertext links so that they can click on and go for getting the desired e-service but become confused when they find that it is only text. They do not like to go to each health center for checking the available e-services.

Also visibility of ehealth services form is not clear and liked by the subjects. It needs to be improved by the addition of more visible fonts, attractive labels, clear text fields, meaning full buttons, drop down menus and helping information.

Currently, landstinget health portal doesn’t give any support regarding accessibility. It is very important to maximise the accessibility of the health portal so that people who may suffer from a range of disabilities become able to access its resources.

6.4 Questionnaire Results

Questionnaire is designed by the authors on the base of finding from usability test and guidelines for usability evaluation of the web sites provided by IS&T Department, MIT [76]. The authors sent the questionnaire to citizens by e-mail for getting their feedback regarding the ltlekeinge portal. All the citizens had different opinion about the ltlekeinge portal and about 15 citizens replied questionnaire.
The table shows the responses of the citizens against the criteria that the authors selected for usability evaluation. Each criteria having minimum one question and this criteria is presented in chapter 7. The authors calculated the percentages for each question from the responses.

### 6.4.1 Analysis

Quantitative analysis of questionnaire was performed by the authors for getting the concrete results. Percentage of each question against the response of participant was calculated. These percentages are shown in table 6.3. The key findings are given below.

For richness criteria, 16% citizens are strongly agree with ‘help’ provided by the system regarding the health services whereas 25% citizens ranked it as agree. 23% does not comment whereas 21% citizens are disagree and 15% indicated it as disagree.
For completeness criteria, 4% citizens are strongly agree that system provides complete information regarding ehealth services in an organized way where as 36% citizens are agree, 40% didn’t comment whereas 17% citizens have an opposite opinion and 3% are strongly disagree.

According to the 06% citizens, system highlights the most important content at the main page and they are strongly agree whereas 22% citizens are agree, 32% citizen did not comment whereas 20% disagree that the system highlights the most important content and 15% citizens are strongly disagree.

16% citizens are strongly agree that the system is easy to understand and use whereas 35% are agreed, 27% citizen didn’t comment whereas 18% are disagree and 4% are strongly disagree.

According to 20% citizens who are strongly agree that the system provide the simplicity whereas 40% citizens are agree and 25% didn’t respond, 14% citizens are disagree and only 1% is strongly disagree.

4% citizens are strongly agreed whereas 36% citizens are agree with the ‘search’ feature, 40% didn’t respond whereas 17% citizens are disagree and only 3% are strongly disagree. The result shows that majority of citizens are satisfied with the ‘search’ feature.

23% citizens are strongly agree that the layout of the system as consistent and 25% citizens are agree, 24% citizen didn’t respond, 21% citizens are disagree and 7% citizens are strongly disagree.

25% citizens are strongly agree that the system is easy to remember whereas 40% citizens are agree and 15% didn’t comment. Only 13% citizens are disagree whereas 2% citizens are strongly disagree.

Only 6% citizens are strongly agree that the system provides the expected outcome whereas 15% citizens are agree, 40% citizen didn’t comment whereas 17% citizens have an opposite opinion that the system does not provide the expected outcome and 22% are strongly disagree.

24% citizens are strongly agree that the system is very easy to navigate while browsing the different pages whereas 31% citizens are agree and 20% citizens didn’t respond, 20% citizens are disagree whereas 5% citizens are strongly disagree.
30% citizens are strongly agree that icons provide meaningful information about the functionality and 27% citizens are agree. Whereas 30% citizens didn’t respond. 10% citizens have an opposite opinion whereas 3% are strongly disagree.

![Chart 6.1: Graphical representation of citizen’s response](image)

This chart shows the weightage in graphical format. On x-axis, each criteria is described by numeric values from 1 to 11. Y-axis shows the percentages of responses. Response of each criteria is represented by alphabetic values from A to E depicting from strongly agreed to strongly disagreed.

![Chart 6.2: Overall result of questionnaire](image)
This chart depicts the overall response of the citizens concerning the questionnaires. Average 17 percent citizens are strongly agree according to the questionnaire results. 29 % citizens are agree and the 26% did not respond in the questionnaires. Average 18 percent citizens are disagree and 7% citizens are strongly disagree according to the results.
CHAPTER 7: DISCUSSION/VALIDATION

This chapter is categorized in three sections. In the first section 7.1, the authors discuss about how much landstinget is useful, different issues regarding landstinget and evaluation of portal on the basis of analysis and selected criteria. In the second section 7.2, the authors will discuss the validity assessment of obtained result. Section 7.3 gives answer to the research question.

7.1 Discussion

7.1.1 Richness

Landstinget portal is not very rich in contents or health related information for citizens. There is lack of complete eHealth services available on the web portal. Also health related information present on the portal is not enough to diagnose all the health related problems of the citizens. A system should be rich to attract more number of users. Landstinget portal will take some time to be rich and for this qualified persons are required who are dedicated to update it continuously.

7.1.2 Completeness

Landstinget portal fulfill the citizens requirements in terms of different features such as searching the required eHealth services, medical advice, nearby clinic and the doctor. For example, citizens are satisfied with “search” feature but sometimes it takes time to fetch the required information. But sometimes the citizens faced difficulties in accessing some ehealth services.

7.1.3 Self-evidence

Self-evidence supports the citizens to learn a system and there is no need to memorize many system related things. Therefore citizens focused on their goal of accessing the health related information and services through the Landstinget health portal. It provides self evidence support in many features to the citizens.
7.1.4 Satisfaction

The criteria of satisfaction in our study tells that how much pleasant the system is for using? In case of Landstinget health portal citizens are satisfied because it is understandable. The citizens can use different features easily because it provides helpful information about the available services. It is very effective and productive for the citizens to investigate their health problems. Questionnaire analysis shows that 35% citizens are satisfied but they want more health services and features to fulfill their needs.

7.1.5 Hypertext Structure

Most of citizens are not pleased with current setup of contents on the Landstinget health web portal. The organization of contents on the Landstinget needs much improvement. For example, pages related to different health services like ehealth services, self assessment of health problems are not very much clear and helpful. Currently, structure of these pages is complex and presentation of information is not well organized.

7.1.6 Autonomy

In case of the Landstinget portal, 31% citizens admitted that system provides navigation control at different locations where it is needed. Authors observed that the portal has no problem regarding autonomy.

7.1.7 Predictability

Landstinget health web portal is not very predictable as most of the time citizens do not get the output what they are expecting. For example citizens click on the required ehealth service and expect it to be a functional link but it is only text without any further link. Citizens also expect that all the health centers offer all the ehealth services, however in actual only some ehealth services are available at each health centers

7.1.8 Consistency

According to the analysis of questionnaire, 25% citizens have an opinion that system is consistent in the term of its layout and many other features like appointment booking,
cancelation, locating health centers and search. This makes the health portal more learnable and efficient because there is no need to learn the similar feature of the portal repeatedly.

7.1.9 Aesthetic

Citizens are not very much satisfied with the interface design of the Landstinget portal. Main page of the health portal is the first point of interaction for the citizens with the health portal. Citizens did not admire the main page because its layout is not attractive and contains a lot of text based contents.

According to authors point of view and observation, instead of text based features the citizens prefer richly colored pages and meaningful icons. A lot text information may distract the users while performing the tasks.

Generally, health web portals support multimedia contents but the Landstinget health portal have no support for this features except some type of images. Health portals often use multimedia contents to demonstrate different health related activities in health domain, therefore Landstinget should have support for this feature.

7.1.10 Simplicity

In case of Landstinget portal most of the citizens are satisfied because it is very simple to use and having the relevant information. It also provides meaningful information to the citizens.

7.1.11 Memorability

Landstinget health web portal is very memorable for use. It also supports the simplicity and users do not feel difficulties in using the health portal. According to the questionnaire, citizens are satisfied with memorability of the Landstinget health web portal.

7.2 Validation

Validation of results plays a very significant role in every type of research study. For this thesis mixed research approach was adopted and major part of work is comprised of qualitative research to obtain the citizen’s opinion regarding the Landstinget portal. Guba and
Lincoln introduced four criteria for judgment of the reliability of a qualitative research study [75]. The authors used these criteria to validate the result. The descriptions are given below.

### 7.2.1 Creditability

Creditability support establishes that the results of qualitative research are believable from the perspective of the participants in the research. [75]

The authors used a multi-phased research methodology in order to achieve the creditability of the thesis. The authors designed the questionnaire on the basis of finding of usability test and literature review. Finally interviews were conducted with different citizens to validate the results of usability evaluation of Ltblekeinge. Appendix shows the details of interviews. The results were successfully validated by the interviews. By using this validation process, the creditability of this thesis is achieved.

### 7.2.2 Transferability

Transferability means to generalize the results of qualitative research for other context or settings [75]. In case of this thesis, the Ltblekeinge is like other typical health portals that provides the similar tools and interface to users. Also this thesis has detail discussion of the context of the LANDSTINGET. These context and settings are helpful in generalizing the findings of this dissertation.

The possible threat is that all the citizens have same cultural background because all selected participants are Swedish. If the test is conducted with non swedish citizens then the test results may be different. Another threat is that many subjects didn’t have enough experience of ltblekeinge portal that may affect the results. One more threat is that ltblekeinge portal does not support media files that many other health portals provide which may affect the generalization of results for the other portals that provide this support.

### 7.2.3 Dependability

Dependability is related to the occurring of changes in context of study over time [75] and the researcher is responsible for describing these changes and their effects on research. The authors select the citizens from county of Blekinge and perform the usability test at different timings according to their ease and availability. Performance of citizens in doing the tasks may get affected due to different timings of the day, for instance in evening and morning citizens
are tired or fresh. It is not possible to conduct the usability test of all subjects simultaneously because “think aloud” technique is selected for usability test.

On the basis of findings of usability test and literature review, questionnaire was designed. The authors distributed the questionnaire to the citizens after one week. It is possible that the citizens may forget different features of LANDSTINGET health portal after one week of usability test which can be a validity threat. To overcome this validity threat, citizens are suggested that they should browse the LANDSTINGET health portal prior to fill the questionnaire.

7.2.4 Conformability

Conformability means that the results gained by the authors after the usability evaluation can be confirmed by the other researcher [75]. Proper documentation of each phase of usability evaluation is done and critically analyzed in order to achieve the conformability of the thesis. The authors adopted the “think aloud” technique for usability test which is a widely used technique for evaluation. Authors used criteria form literature and guidelines for usability evaluation of the web sites provided by IS&T Department in order to design questionnaire.

7.3 Answering the Research questions

Authors advance in steps all the way through thesis to find the answer to the research questions. For this purpose usability test was conducted, the results of which were validated through questionnaire and interviews respectively. The authors find that ltblekeinge health portal have potential to be effective for citizens in accessing the health related information and services. It supports them to look after their health and helps them in accessing health services and health related information in an easy to access way. However the results suggest that ltblekeinge portal are not very effective with set of tools and interfaces. In addition, it is very significant for a health portal that it should contain adequate amount of useful and relevant health content. Moreover, it is very important that accessibility of ehealth services, current set of tool and health related information should be improved.
8-EPilogue

This part of thesis consists of conclusion, recommendations for improvement in portal and proposed future work.

8.1 Conclusion

The major objective of this thesis is to evaluate the liteblekeinge health portal to find out its effects on citizens while accessing the health related information and services. The usability evaluation is done empirically. The authors selected fifteen citizens from the county of blekinge for usability test. A natural setting is selected for conducting the usability test where citizens performed in a balanced environment. The usability test is conducted individually form the citizens on the liteblekeinge portal in same environment. The authors derived finding from the usability test which were used along with literature review for designing the questionnaire. Questionnaire was distributed among the citizens who already took part in usability test. After obtaining the results from questionnaire and usability test, evaluation of system is done. The authors validate the result with the help of interview with a number of individual citizens.

To the research question, the authors find that liteblekeinge health portal have potential to be effective for citizens for accessing the health related information and services. It supports the citizens for taking care of their health and helps them in accessing health services and health related information in an easy to access way. However the results suggest that liteblekeinge portal is not very effective with set of tools and interfaces currently available. In addition, it is very significant for a health portal that it should contain adequate amount of useful and relevant health contents. Moreover, it is very important that accessibility of ehealth services, current set of tool and health related information should be improved.

8.2 Recommendations

Based on the observations, citizen’s comments while doing the tasks in usability test, test analysis, results from questionnaire and interviews, following recommendations are being proposed. These recommendations might be helpful to improve the liteblekeinge health portal.
Main page need to be improved in order to make it simpler having only those contents which are extremely important. To make it simpler authors suggests that quick links, featured pages, and headings along with the contents or links to other pages should be eliminated from the main page.

Currently the landstinget portal has fewer contents and the available health related information is not enough to diagnose all the health related problems and how to cure these diseases. There is need of qualified health professionals who are dedicated to update the required health information continuously.

There is a need to improve the layout of page which is providing information about the symptoms of different diseases, its treatments and advice on self care. Instead of long text there should be graphical representation of health information. Procedure of advice on self care should be in the form of sequence of steps asking the patients about different questions related to their problem and giving the final result after analyzing all the information.

According to the author’s observation, citizens couldn’t perform well because most of them have very little awareness about searching/accessing health information and ehealth services on lblekeinge health portal. Training sessions might be arranged by the Blekinge hospitals and clinics on using the lblekeinge health portal and to create awareness among the citizens about this portal. This training session can be helpful for those citizens who have no previous experience of using it or who are hesitant to use this portal.

It is always desirable to provide detailed help for users but very lengthy description is not a good idea and most of the users are not satisfied by it. Help pages at lblekeinge health portal are heavily stuffed. To make the help pages easily understandable for citizens, it is required to make these pages simpler and light. Users like hit and trial method to do perform different functions and they do not want to spend their time while reading lengthy descriptions.

Generally, health portals use multimedia contents to demonstrate different health related activities in health domain but currently the Landstinget health portal have no support for these features except some type of images. Landstinget should support audio and video multimedia contents to make it more interactive and effective along with providing fast access with such rich contents.

Observations shows that while performing different operations during the usability test appropriate warning or error messages are not provided by the Landstinget. These messages need to be revised and should contain more explanation about the particular operations.
As many citizens living in Sweden are not Swedish therefore landstinget health portal should also be available in languages other than Swedish e.g. English in order to cover a large number of citizens. This will make Landstinget more useful for all the citizens.

Layout of ehealth services page needs much improvements to make it more helpful and visible for the citizens e.g. ehealth services options should appear as hypertext links providing links to health centers offering these services. Also visibility of ehealth services form should be improved by addition of more visible fonts, attractive labels, clear text fields, meaning full buttons, drop down menus and helping information.

Web accessibility means that everyone can access web regardless of disability. Currently, landstinget health portal doesn’t give any support regarding accessibility. It is very important to maximize the accessibility of the health portal so that people who may suffer from a range of disabilities become able to access its resources. Special pages should be designed for users with disabilities according to the accessibility standards.

The Frequently Asked Questions (FAQ) contains a list of questions asked every day by the citizens and their answers. Information available at the FAQ page can help the citizens to find the solution of the problems related to usage of the website. Some citizens proposed that a FAQ page should be available on the portal.

8.3 Future work

The study is an attempt to participate in the field of usability evaluation of health web portal. The finding of this thesis might be supportive for the improvement of Landstinget health portal in delivering the health related information and services successfully. Future research is needed in the following areas. A research is needed to explore the issues related to the trust of the citizens on the quality of available health related information for their health problems. A future study can be conducted in order to design the health portal to meet the needs of people with disabilities, so that web portal can be used as effectively and for the same purpose by a person with disability as by a person without a disability. There is need to conduct a study on the availability of landstinget in other languages especially in English.
References:


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[64] Pagliari C., PhD. "eHealth", D JMIR the leading eHealth journal, http://www.jmir.org/2005/1/e9/, [accessed 2009-16-04]


## Appendix A: Questionnaire for Usability Evaluation

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<th>Questions</th>
<th>Strongly Agreed</th>
<th>Agreed</th>
<th>No-Comment</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Health Portal provides me the necessary help that is required</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>The Health Portal provides a customized layout.</td>
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<td>3</td>
<td>The Health Portal provides complete information regarding ehealth services in an organized manner.</td>
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<tr>
<td>4</td>
<td>I am able to find content in an organized way.</td>
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<tr>
<td>5</td>
<td>The Health Portal highlights the most important content at the main page.</td>
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<tr>
<td>6</td>
<td>The Health Portal is very understandable and easy to use.</td>
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<tr>
<td>7</td>
<td>The Health Portal helps me to be more effective and productive</td>
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<tr>
<td>8</td>
<td>The Health Portal saves my time for completing the task.</td>
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<td>9</td>
<td>The Health Portal requires very few steps for completing the tasks.</td>
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<td>10</td>
<td>I am satisfied with the “search” feature of the system.</td>
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<tr>
<td>11</td>
<td>The Health Portal provides appropriate message in case of error.</td>
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<tr>
<td>12</td>
<td>I am satisfied with the portal layout, it remains the same when navigating from one page to another.</td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>How to use the Health portal is very easy to remember.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14</td>
<td>Whenever I perform a task the outcome from the Health Portal is according to my expectation.</td>
<td></td>
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</tr>
<tr>
<td>15</td>
<td>It is very easy to navigate while browsing different pages or performing different tasks on the Health portal.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Icons and links on the Health portal provide meaningful information to me.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Appendix B: Screen shot of Ltblekinge portal

Screen 1. Main page
Screen 2. E-Services page
Screen 3. Self care and Diseases
Screen 4. Dental Clinic
Boka tid

Information om hur e-tjänsten

Boka tid fungerar:

Det är viktigt att du anger i

формулар, till regler som

minst, vilka delar av

som liksom om du skickar

med ett poäng.

Val av tidbok

Välj vilken tidbok du vill boka tid i

- Välj Dödbok

Välj vilken vecka (se 45)

eller

från och med vilket datum du vill se tidboken (LLMÅ-ÅND-OD)

Steg 1 av 5  Nästa  Avsluta

Screen 5. Choices of time book Stages 1 of 5
Screen 6. Choices of day and time Stages 2 of 5
Screen 7. Stages 3 of 5: Confirm time choices
Screen 8. Stages 4 of 5: Records
Boka tid

Tidbank
Rör 2
Datum: 2009-06-04
Tid: 13:40

Beställsordning
Steg 5 av 5
OK
Andr

Screen 9. Stages 5 of 5
Appendix C: Interview

Citizens # 1

Q: What was your first impression of the Landstinget Blekinge Health portal?
Ans: It looks simple to use and having relevant information. Color combinations are nice and overall appearance is balanced.

Q: What is the most interesting thing you find in Landstinget Blekinge Health portal?
Ans: It is consistent in the term of its layout and many other features like appointment booking, cancelation, locating health centers and search.

Q: What is your purpose or need to use the Landstinget Blekinge Health portal?
Ans: Its providing the ehealth services and my purpose to use this portal is to get the benefit from available services.

Q: What are the merits of the Landstinget Blekinge Health portal in your opinion?
Ans: The layout of the page is very memorable for use. It also supports the simplicity and users do not feel difficulties in using the health portal.

Q: What are the drawbacks of the Landstinget Blekinge Health portal in your opinion?
Ans: It is not very predictable. I do not get the expected output.

Q: How do you compare Landstinget Health portal with any other health portals?
Ans: Direct access of information is available which is a good thing.

Q: How Landstinget Blekinge Health portal could be better for providing health services?
Ans: A system should be rich to attract more number of users.

Citizens # 2

Q: What was your first impression of the Landstinget Blekinge Health portal?
Ans: The introduction screen is simple and understandable

Q: What is the most interesting thing you find in Landstinget Blekinge Health portal?
Ans: The most interesting thing for me. Its provides the ehealth services. So i can get benefit.

Q: What is your purpose or need to use the Landstinget Blekinge Health portal?
Ans: A lot of services are available on this portal like book the appointment, renew appointment, ordering certificate, travel vacation etc so i can avail all these facilities and get benefit.
Q: What are the merits of the Landstinget Blekinge Health portal in your opinion?
Ans: To about the system is easy and there is no need to memorize many system related things.

Q: What are the drawbacks of the Landstinget Blekinge Health portal in your opinion?
Ans: Quite a lot of services that up to now is not possible to perform

Q: How do you compare Landstinget Health portal with any other health portals?
Ans: On the information aspect there are lots of examples of health information sights that are more elaborated

Q: How Landstinget Blekinge Health portal could be better for providing health services?
Ans: Informing people about health issues is always a good thing which effect their behaviour.

Citizens # 3

Q: What was your first impression of the Landstinget Blekinge Health portal?
Ans: Pretty logical structure.

Q: What is the most interesting thing you find in Landstinget Blekinge Health portal?
Ans: Advice on self care and information about different deceases is an interesting opportunity.

Q: What is your purpose or need to use the Landstinget Blekinge Health portal?
Ans: It is important for me to be able to make an appointment or cancel and get information about health related problems and treatment.

Q: What are the merits of the Landstinget Blekinge Health portal in your opinion?
Ans: Pretty logical structure.

Q: What are the drawbacks of the Landstinget Blekinge Health portal in your opinion?
Ans: Many services are listed but not available.

Q: How do you compare Landstinget Health portal with any other health portals?
Ans: It lacks in sense of graphical representations as compared to other portals.

Q: How Landstinget Blekinge Health portal could be better for providing health services?
Ans: Most of available information is in the form of text. If it is converted into graphical representation like pictures or audios or videos then it will be more effective
Citizens # 4

Q: What was your first impression of the Landstinget Blekinge Health portal?
Ans: It sounds good and has a lot of information.

Q: What is the most interesting thing you find in Landstinget Blekinge Health portal?
Ans: Getting latest news about the health and health departments is a good option.

Q: What is your purpose or need to use the Landstinget Blekinge Health portal?
Ans: I’m looking for information on how I can manage my health.

Q: What are the merits of the Landstinget Blekinge Health portal in your opinion?
Ans: Well structured and easily navigatable.

Q: What are the drawbacks of the Landstinget Blekinge Health portal in your opinion?
Ans: It requires time to search and explore different services available which is a boring.

Q: How do you compare Landstinget Health portal with any other health portals?
Ans: Information on diseases is limited.

Q: How Landstinget Blekinge Health portal could be better for providing health services?
Ans: Forms for accessing different e-health services should be improved.

Citizens # 5

Q: What was your first impression of the Landstinget Blekinge Health portal?
Ans: It is good option to search for information about the health problems and health departments.

Q: What is the most interesting thing you find in Landstinget Blekinge Health portal?
Ans: It is beneficial to visit it before going to the doctor.

Q: What is your purpose or need to use the Landstinget Blekinge Health portal?
Ans: I want to look for information about various diseases and treatments.

Q: What are the merits of the Landstinget Blekinge Health portal in your opinion?
Ans: It is a good way to provide the health information to citizens.

Q: What are the drawbacks of the Landstinget Blekinge Health portal in your opinion?
Ans: It contains a lot of textual data instead of pictorial representations.
Q: How do you compare Landstinget Health portal with any other health portals?
Ans: Authenticity of information on different diseases is not available

Q: How Landstinget Blekinge Health portal could be better for providing health services?
Ans: Improvement in presentation of information at different pages can be beneficial.