End-user challenges after the implementation of a new health information system: A case study in one municipality in a region in the south of Sweden

Author: Janette Salomonsson Mutesi
Supervisor: Malin Hofflander
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Summary/abstract

Swedish municipalities invest enormous amounts of resources in health information systems (HIS) in order to have a competitive edge, reduce cost in operations, faster storage and retrieval of patient information, foster transparency, efficiency and effectiveness in service delivery. This study examines the major challenges faced by the system end-users after the implementation of the new health information systems in the elderly and care homes in a municipality in a southern region of Sweden.

The rationale for the examination is derived from the discovery that the municipality is yet to fully utilize the new-HIS, despite huge investments in procurement, supervision and training of users. The major reason why this topic was chosen was due to the challenges encountered while working as a care giver staff in one municipality in a southern region of Sweden. In this study, The technology acceptance model (TAM ) is used to better understand the current working of the new-HIS.

Mixed methods are utilized to conduct the case study; semi structured interviews and questionnaire survey. The findings of this study are presented in the findings chapter and have shown many shortcomings in the use of the new-HIS such as limited supervision from top management, inadequate skills, inadequate computers, long procedures thus time wasting, insufficient resources like financing and policies among others as further discussed in the research findings chapter in this report.

Finally, this study proposes the findings as contributions to the study of challenges faced by end-users after the introduction and reception of the new-HIS by the given case study; and it propagates share of experiences and lessons to be learned.
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<tbody>
<tr>
<td>HIS</td>
<td>Health information system</td>
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<tr>
<td>ICT</td>
<td>Information Communication and Technologies</td>
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<td>IS</td>
<td>Information system</td>
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<td>IT</td>
<td>Information Technologies</td>
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<td>TAM</td>
<td>Technology Acceptance Model</td>
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<td>TRA</td>
<td>Theory of Reasoned Action</td>
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<td>QDA</td>
<td>Qualitative Data Analysis</td>
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<td>HIT</td>
<td>Health Information Technology</td>
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<td>HSL</td>
<td>Health care law</td>
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<td>SOL</td>
<td>Social care service law</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<td>TPB</td>
<td>Theory of planned behavior</td>
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1 Introduction

1.1 Introduction/Background

We live in a fast-changing world where technology is constantly improving; this requires highly trained personnel who are also information technology advocates to embrace and display capability in implementing innovations into healthcare (Hoyt et al. 2009). Digitization offers great opportunities for future social services, health and medical care (Social department 2010). Health information system (HIS) has been utilized for collecting, processing, storing, and transferring the required information for planning and decision-making at different levels of the health sector to provide quality services (Feyzabadi et al. 2015). Modern information and communication technologies can make it easier for individuals to be involved in their own health and social care which in return makes it easier to provide more efficient support systems for both staff and service providers (Hoyt et al. 2009). Implementing Health information systems has been a growing trend among healthcare providers in Europe (Alsharo et al. 2018). There is a general agreement that HIS can improve the quality of healthcare delivery, reduce cost of medical care and enhance the efficiency and effectiveness of healthcare organizations (Hoyt et al. 2009).

People in Sweden are living increasingly longer with an average life span of 84.1 years for women and 80.4 years for men. In 2013, 19.4 percent of the country’s population was 65 years older which means Sweden proportionally has one of Europe’s largest elderly populations. This as a result, has exerted a lot of pressure on the country’s healthcare sector there by calling for the need for solutions (Public health agency Sweden).

The studies unequivocally mentioned the use of health information technologies such as e-health, e-prescription as key solution elements to better healthcare (Ngafeeson, 2014). However, IT user resistance in healthcare is continually cited as a major barrier to achieving desired outcomes (Ngafeeson, 2015).

While HIS have proved to be beneficial in solving the impediments of quality healthcare service, implementation efforts are failing in a major way due to the complexity of the healthcare environment and professionals’ resistance to adopt the technology (Heeks et al. 1999). It is also noted that healthcare professionals especially physicians and nurses are reluctant to use HISs because they feel it’s an interruption in their healthcare work (Alsharo et al. 2018). Researchers in information technology have recognized user resistance to IT as an important reason for the failure of a new system (Ngafeeson, 2015). However, there is need for more research to critically appraise new information technologies before they are recommended on a large scale and need for better methods to train healthcare staff to improve productivity, patient safety and reduce human resistance in the future (Hoyt et al.2009).
1.1.1 Motivation
During my internship in one of the elderly homes in southern region of Sweden, I directly interacted with the system and even with other users who interfaced with the system daily while carrying out their duties. These included nursing staff, officers, and section managers. It was found out that many of the users had several challenges using the system depending on which level they interfaced with the system thus intriguing this survey to address these challenges and gaps.

1.1.2 Health information systems (HISs)
Health information technology consists of a wide range of networking technologies, clinical data bases, electronic medical health records and other specific biomedical, administrative and financial technologies that generate, transmit and store health care information (Ngafeeson, 2014). Health information system is a set of components and procedures organized with the objective of generating information which will improve health care management decisions at all levels of the health care system (Ngafeeson, 2014). They are used in health care to devise, execute and measure health interventions which have reliable data and performance of different parts of the health system (World Health Organization 2000).

1.1.3 Overall quality of health care
Sweden’s vision 2025 is to be the best in the world at using the opportunities offered by digitization and e-Health. This will make it easier for people in Sweden to achieve equal health and to develop and strengthen their own resources for increased independence and participation in the life of society (Social department 2010). HIS has many opportunities which might contribute to better quality care. Ngafeeson (2014) provides insights as to how HIS can improve overall quality of care and patient outcomes in a population and these include; more complete, accurate and structured clinical data documentation and summarization of data for information generation, direct-access to patient records and reduced medical mistakes, increased decision support from structured data and predictive modeling and disease management tools. These may lead to improvement in clinical decision making through decision support, rapid dissemination of information and quicker monitoring of care which is enabled by health information exchange. Through the capabilities of HIS, mistakes are kept at bay, information quality is enhanced, treatment response times are improved, and optimal decision making is attained.

1.1.4 Challenges faced by the system end-users of HIS
Despite the huge potential and opportunities that lie in use of HIS to radically transform healthcare sector, many challenges are evident and imminent. The adoption of IT in health care has been particularly shown as lagging that of major industries by as much as 10 – 15 years (Ngafeeson, 2014). This is further exacerbated by the failure in implementation of HIS as well as resistance to the use of the technology by healthcare professionals (Heeks, 2006).
These challenges range from issues related to the technology itself, the healthcare setting, system users and the regulatory environment. Challenges stem from the interaction of technical, human and organizational factors affecting the adoption and use of these healthcare systems. To better explain the factors affecting the use of the HIS, the technology acceptance model was used. This model was conceived to be used to measure the health information systems acceptance by the users of the system. According to Yates et al. (2001) the major challenges faced by the end-users of HIS include: - Lack of management support, lack of user involvement, resistance to change, lack of change management program, poor project management and lack of training.

### 1.2 Previous research

Ngafeeson (2014) recommends that there must be future research where HIS implementation should recognize and respond to a contextual view of implementation. Technology being introduced in an organization cannot be looked upon as a mere technical project, but it should be run with a project team whereby all stakeholders especially system end-users are involved from start to the finish including top management (Berg, 2001). User involvement must go from just being a good slogan to a seriously thought through and followed through strategy for achieving IS implementation success.

Nilsson (2014) suggests that there must be future work about social challenges when implementing IS in the Swedish healthcare organizations which should focus mainly on nurses and their experiences with the system and other healthcare professionals.

Alsharo et al. (2018) investigated the importance of healthcare professionals’ attitude towards the continuous use of HIS, focusing on how habit can influence healthcare professional’s evaluation of healthcare technology’s outcomes and the degree to which habit can influence intention to continue using the HIS, and the results showed a significant impact of habit on attitudes and intention to the use of HISs.

Specific information relating to challenges faced by the system end-users is scanty available, this study therefore has been designed to generate information on the challenges that system end-users face while interfacing with the new-HIS. It is well accepted that information generated by the health care systems is used for planning, management of health commodities, detecting outbreaks and monitoring the overall performance of the health systems that further maintains the quality of care (Davies, 1993). Lack of user acceptance is a significant impediment to the success of the HIS in general. Users are often unwilling to use the system which if used would result in impressive performance gains, therefore user acceptance has been viewed as the pivotal factor in determining the success or failure of the HIS (Davies, 1993).

Although HIS implementation has so many opportunities, such as increasing legibility, reduced medical errors, shrink costs and boost the quality of healthcare, nevertheless, the journey to this ideal is fraught with challenges. These challenges range from issues arising...
from the very nature of healthcare information, to the issues pertaining to HIS and its users (Ngafeeson, 2015).

1.3 Problem statement

1.3.1 User’s challenges after the implementation of the new-HIS

The national e-health care authority is working for better information exchange in the healthcare sector though there is a major challenge of supporting the government’s strategies of e-health care both at national and international levels (Regeringskansliet 2011). In 2006, the national IT strategy for health and social care was introduced with hindsight of an increasingly aging population and rising needs for safe and accessible healthcare for everyone. The strategy declared that the Swedish healthcare organizations needed to use IT support and tools (IS) in everyday work to have a competitive edge, reduce cost in operations, faster storage and retrieval of patient information, foster transparency, efficiency and effectiveness in service delivery (Regeringskansliet 2011). Despite all the benefits of using a new technology, many researchers attest to the fact that people have developed resistance towards the use of modern information technologies. Ngafeeson (2014) identified resistance to information systems as a major reason for the failure of adoption of new technology. Orlikowski and Gash (1994) indicate that staff members and users need to interact with IT and make sense of it. In the sense-making process, staff members such as health care staff and patients together build up expectations and knowledge that will function as the foundation for future actions towards the technology.

Despite the tremendous investments by the Swedish government in infrastructure and IT / IS resources, follow up reports presented delays in implementation of IT projects on national and local levels (Nilsson, 2014).

Among the challenges highlighted are those that affect the users of the system such as nurses and IT-support staff, patients, managers, clinicians, public health, government, medical educators, insurance companies, hospitals, researchers, technology vendors, and decision makers. Lack of support by the medical staff (physician resistance) has been identified as a major challenge and the second most commonly perceived obstacle to adoption (Hoyt et al. 2009).

The success of the HIS is mainly dependent on the level of acceptance by the intended users because without acceptance, discretionary users will seek alternatives while even dedicated users will be likely to seek to manifest dissatisfaction (Jung & Loria, 2010). Acceptance has been conceptualized as an outcome variable in a psychological process that users go through in making decisions about the technology. This research seeks to understand the dynamics of human decision making in the context of accepting the technology (Jung & Loria, 2010).
1.4 Objective of the study/ Research question
The general objective of the study is to examine the challenges faced by the end-users at elderly care homes in a region in the south of Sweden, after the introduction of the new-HIS. To specifically understand how the new system affects all stakeholders, how they carry out their day today work and how they accept and adopt the new-HIS. This study focuses especially on the system end-users and these are the people who interact with the new system during their everyday work. These include section managers, administrators, nurses, nursing assistant, healthcare assistants to mention but a few.

1.4.1 Research question
What are the challenges faced by the end-users of the new-HIS, after its implementation?

1.4.2 Significance of study
The study might help the policy and decision makers when making new-HIS user decisions in a southern region municipality and other municipalities, health care entities and this might help to eliminate the various challenges that have been faced after the introduction of the new-HIS. The study might help the government/councils in establishing the policies and guidelines on the use of new-HIS.

2 Background/Theory

2.1 User acceptance
According to Ngafeeson & Sun (2015) the adoption of new IS varies from person to person. A lot of money is spent to acquire new technologies; however, technology acquisition does not automatically translate to technology usage, the subject of technology acceptance has, and continues to garner research attention, the study of adoption behavior however has gained increasing attention in information systems within the last decades, due to the increase in new and innovative technologies. The key focus according to Ngafeeson & Sun (2015) was why do people accept or reject new technology. The previous research has shown five groups of adopters of innovations namely: innovators, early adopters, early majority, late majority and laggards. Many theories have been used over the years to explain the adoption behaviors of humans. The technological acceptance model (TAM), is often used in the understanding of this phenomenon, and is based on a view that perceived usefulness correlates strongly with user acceptance, i.e., intention to use the system; and as such user acceptance is a strong predictor of actualization (Ngafeeson & Sun, 2015).

In the field of healthcare, the introduction of HIS has proved to be beneficial in solving the impediments of quality healthcare service; however, efforts are failing tremendously, due to the complexity of the health care environment and professionals’ resistance to adopt the technology (Alsharo et al. 2018). The complexity perspective of healthcare covers the interaction of different actors in order to achieve different goals. It is evident in Ngafeeson
& Sun (2015) studies that healthcare professionals are reluctant to use HISs for reasons such as perceived reduction of their professional autonomy, the possibility of an HIS being used against them in judicial disputes, and that HIS takes practitioner-patient meeting time. According to Alsharo et al. (2018) the factors affecting acceptance towards a technology may differ from business-oriented organizations to healthcare. Alsharo et al. (2018) noted that healthcare professionals’ resistance to using or adopting the technology is highlighted as a factor for failure of HIS projects, because HIS is perceived as an interruption in healthcare practice. Users’ adoption has been also highlighted as an obstacle to the system use (Ngafeeson, 2015). The complexity of healthcare environment and professional’s resistance to adopt the technology was identified as an obstacle to system success efforts as well (Alsharo et al. 2018).

2.2 Factors that could affect information system adoption

According to Davies (2009) the context of use of an information system is defined by the usability, the user interface, the user setting, stakeholder involvement and stakeholder satisfaction. The use of the system and the user’s satisfaction can be influenced by both the quality of information system itself and the quality of the information it generates. The usability focuses on use of system, how easy it is to use the system depending on the purpose of which the system was implemented, and this can be evaluated on five dimensions and these include (Learnability), or how easy it is to learn to use the interface, (rememberability) or how easy it is for the user to remember learned operations, how efficient it is to use during data access, (reliability) is about making fewer errors and user (satisfaction) the interface should satisfy the users in the sense that it leaves them subjectively pleased with using it (Davies, 2009).

2.3 Barriers to Health Information Technology (HIT) Adoption

According to Hoyt et al. (2009) HIT adoption has multiple barriers, for example inadequate time, cost, change in workflow etc. Healthcare professionals complain that they don’t have time to read and learn new technologies. Change in workflow can affect their work as healthcare personnel are accustomed to handwritten notes. Integrating HIT with workflow was identified as the key challenge rather than the technical know-how. Other challenges highlighted by Tossy (2014) include; Poor infrastructure, inadequate skills, lack of training, financial resources, lack of stakeholders’ participation and awareness; parallel reporting and lack of coordination, and absence of supportive supervision.

Successful integrations of HIS require technology infrastructure such as software, hardware, and network. Previous research has noted that system acceptance requires skilled personnel, who can provide technical support and training; yet, health care institutions lack knowledgeable personnel with capabilities of integrating and implementing the HIS. Most health organizations merely spend money on HIS, without investing in training and redesigning processes (Tossy, 2014). According to Avison & Fitzgerald (2002) education and training can improve IS acceptance.
Lack of participation and awareness is also highlighted as barrier to acceptance and adoption of HIS. (Tossy, 2014). Absence of Supportive Supervision; Resistance to adaptability and support from the management of institutions remain a major concern for system acceptance. Health professionals in management positions feel that the use of HIS and offer of supervision to support staff with use of HIS will take up time for their primary duties (Rodrigues, 2010).

2.4 Theoretical framework/ Technology acceptance model (TAM)

In order to understand the user’s behavior towards continuing use of the HIS, a review of the TAM theoretical framework in the information system was used. (TAM) was adapted from the theory of reasoned action (TRA), a general social –psychological behavioral theory that is based on understanding a variety of behaviors in IT use (Ngafeeson & Sun 2015). TAM is recommended as a useful model in understanding users’ attitudes, usage intentions and acceptance and how they are related to each other (Ngafeeson & Sun 2015). Based on (TAM), user’s acceptance is influenced by perceived usefulness and perceived ease of use (Alsharo et al. 2018). Perceived usefulness is the degree to which an individual believes that by using a system would improve on his or her job performance (Handayani et al. 2017). The end-users may feel that by using the new-HIS in their work, can support them to work more effectively and improve on productivity, and by so doing they will become more willing to use the new-HIS. Factors that could affect information system acceptance and adoption can be seen in (chapter 2.1, 2.2) The perceived ease of use refers to the degree to which a person believes that by using a system would be free of effort (Handayani et al. 2017). There exists a relationship between perceived usefulness and the behavioral intention to use the system (Ngafeeson & Sun, 2015). The technological acceptance model of Davis, Bagozzi & Warshaw (1989) is shown below in figure 1.

The technological acceptance model TAM

![Figure 1 The technical acceptance model by Bagozzi&Warshaw (1989).](image-url)
By adapting TRA, individuals’ acceptance or rejection of the new technologies is often analyzed (Handayani et al. 2017). In this research the perceived ease of use of (HIS) will depend on users experience while interfacing with the information system. The users will be willing to use the new-HIS if it is easy to use, learn, and easy to remember learned operations or they will reject the new-HIS if it is difficult to use. Ngafeeson & Sun (2015) argues that perceived ease of use will both affect perceived usefulness and the behavioral intention to use the HIS. It is also stated that the theory of planned behavior (TPB) was proposed as an extension of TRA for conditions where individuals do not have complete control over their behavior. Ngafeeson & Sun (2015) further claims that other theories have become instrumental in our understanding of technology adoption behaviors. It’s further explained that the addition of perceived behavioral control in TPB, reflects the internal and external constraints on behavior, and is directly related to both behavioral intentions to use and actualize. In this study the internal and external constraints on behavior that will affect the intention to use, adoption of HIS, and barriers to adoption are also incorporated see (chapter 2.3).

3 Methodology

This chapter consists of different stages in which the study was conducted. It includes; research design, target population, data collection methods and procedures, and data analysis. It as well includes validity, reliability and ethical considerations for the study.

3.1 Research methodology/Study design / Research approach

The mixed methods research was used to investigate the challenges faced by the end-users of the new-HIS. The mixed method is an approach which gives a researcher possibility to gather both qualitative and quantitative data, combines the two, and then draws interpretations based on the combined strengths of both sets of data. The mixed methods approach can give a more comprehensive understanding of the research problem. The exploratory sequential design was used; this method begins with the qualitative exploration of a human phenomenon and the qualitative data findings are used to develop a new intervention for use in quantitative experimentation (Florczak& Kristine, L. 2014).

The qualitative data collection methods were used to investigate the challenges faced by the end-users of the new-HIS and the interview findings were used to understand challenges faced by the end-users of new-HIS. In addition, the quantitative data collection method was used by help of the questionnaire survey and the quantitative data was transformed into meaningful numerical data in order to understand the problem as well.

The mixed method approach was suitable for this research because it gave a comprehensive understanding of the research problem and also gave direct interaction with the staff in some of the elderly care homes in a region in the southern part of Sweden. The qualitative data collection and analysis was supplemented by the quantitative data to acquire both a broader and deeper understanding of the challenges faced by the end-users.
of the new-HIS. However, this method is time consuming and is difficult to transform qualitative data into new variables of interventions (Dudovskiy, 2016).

An inductive approach was also used during this study; this is also known as inductive reasoning which starts with observations that are proposed towards the end of the research process. Inductive research involves the search for patterns from observation and development of explanations – theories for those patterns through a series of hypothesis (Dudovisky, 2016). It aims to generate meaning from data collected in order to identify patterns and relationships to build a theory and it doesn’t prevent the researcher to use existing theories to formulate the research question to be explored (Doyle, 2019). No theories or hypothesis apply in inductive studies at the beginning of the research. This is based on learning from experiences, patterns resemblances and regularities to reach conclusion and proceeds from a premise about a sample group to a conclusion about the given phenomenon.

3.2 Research strategy
The case study was selected, and this is a design of inquiry found in many fields, especially evaluation in which the researcher develops an in-depth analysis of a case, often a program, event, activity or process (Jacobsen, 2002). In this research, stakeholders or users of the system in different elderly care homes were interviewed making this strategy appropriate for the research.
In addition, a questionnaire survey was applied, this was done to complement the qualitative data finding and to make the research more valid. The mixed method approach was chosen because the study intended to use a combined strength of both the qualitative and quantitative data which can give a more comprehensive understanding of the research problem. The mixed method was therefore suitable because the analysis was based on both qualitative and quantitative data while emphasizing details, nuances and a unique understanding of phenomenon and high internal validity and reliability of the study. The analysis was also based on both the qualitative as well as quantitative to better understand the research problem.
The approach of inductive theory of reasoning was used where the research developed empirical generations for the data collected through interviews. It is mainly concerned with the generation of new theory emerging from the data collected. This is the bottom up approach where the researcher uses observations, interviews, and questionnaire survey to build an abstraction to describe a phenomenon that is being studied (Jacobsen, 2002). In this case, interviews and questionnaires were employed to collect data that was later developed into raw data and analyzed in order to come up with a new theory.

3.3 Selection (Research settings, target population and sample)
The target population was elderly care homes in a region in the south of Sweden, half of the elderly care homes to be specific were involved, and three out of six homes were visited. All the key informants were contacted via telephone and only 3 homes were willing to participate. The combination of different selection methods was used such as
random and snowballs. The snowball method was used for interviews; this method was chosen because of its flexibility (Jacobsen, 2002). The research began with interviewing the key informants i.e. project manager / system owner. The results from this interview contributed to relevant information about the new-HIS and its stakeholders.

The key informants of this research were the system owner/ project managers, elderly home managers and administrative managers. These were the employees who had both major roles of responsibility in the use of the new-HIS and end-users as well. While the key respondents were staff who interface with the system in order to pursue their daily work, and these didn’t have any role of responsibility in the use of new-HIS, the key respondents included managers, administrators, nurses, nursing assistants and care givers.

Both the informants and respondents have been identified and considered as persons possessing knowledge regarding the system and its operation. The participants were identified after contacting the heads of department of the elderly care homes, a random selection procedure of participants for questionnaires was employed. This was done after a discussion with the section managers, who gave out the total number of staff, 25 copies were delivered to every home unit and managers forwarded them to end-users during their monthly workplace meeting. The section managers also encouraged their staff to cooperate during the survey process. The results were collected after two weeks, 60% response was achieved. The time taken to conduct this research was 3 months.

3.4 Data collection method
Data was gathered through a combination of interviews and questionnaire survey with the key informants /respondents who were departments and elderly care home staff.

3.4.1 Qualitative data collection method / interviews
Interview is a qualitative research technique used to gather information which involves conducting individual face to face communication between one or a small number of respondents to investigate their views on a situation (Cadle et al. 2010). The qualitative research methods are designed to help researchers to understand people, social and cultural contexts within where they live. They describe social phenomena as they occur naturally; no attempt is made to manipulate the situation (Marvasti, 2003). Carrying out interviews, according to Creswell (2013), is best suited when few units are examined and when the researcher is interested in what the individual is saying regarding a situation, however it’s a time-consuming method. The research was done through visiting various selected elderly care homes in determining their experiences/challenges while interacting with the HIS. Prior to the interviews, two different interview question papers were created, this was done because the informants had different roles of responsibility during the implementation of the new-HIS. And the questions were structured according to their roles of responsibility. One of the interview question paper was for the overall project manager and the other interview questionnaire was used by both the managers and administrators and these work as end-user support as well. The
benefits of using the same interview question paper was meant to investigate different views of the phenomenon. The two-interview guide can be seen in Appendix B. A total of six interviews were done altogether. Two interviews were done with the system owner/project manager, the aim here was to gather relevant information about the new-HIS and its stakeholders. Thereafter, four interviews were done with two elderly home managers and two administrators who worked as end-user support during the time of implementation.

The interviews were carried out at the staff designated work posts with a view of having them relaxed and not to feel put on the spot. While making the recording of the interview, note taking procedure was selected. Creswell (2008) recommended the researcher to take notes in case of system failure. The raw data was prepared based on notes and recording. After checking the validity and reliability, the formulated raw data was analyzed. The shortest interview took 30 minutes while the longest 45 minutes, notes were taken, interviews recorded, and interviewees were made aware of the purpose of the study and re-assured of their confidentiality and the right to decline to answer any question they didn’t want to. The modes of interview questions were semi-structured with each informant asked a pre-established set of questions (see interview guide appendix B) elaboration and additional questions followed where necessary.

3.4.2 Quantitative data collection method/questionnaires survey

In addition, structured questionnaires were also used to collect data from relevant end-users of the new-HIS, this was done to supplement the data collected during interviews. The structured questionnaire was also created, and the same questions were used by all respondents regardless of their profession, this was done to determine the user’s acceptance and ascertain the challenges that they face while interacting with the system. The structured questionnaires can be seen in Appendix C. The questionnaires were administered to the elderly care home managers who passed on the questionnaires to their staff to be filled. Advantages of questionnaires include increased speed of data collection as it covers a wide area, low or no cost requirements and higher levels of objectivity compared to alternative methods of primary data collection (Dudovskyi, 2016). Disadvantages with questionnaires are selection of random answer choices without properly reading the question moreover there’s usually no possibility for respondents to express their additional thoughts about the matter due to absence of a related question (Dudovskyi, 2016).

3.5 Data Management and analysis

The results of this study were analyzed using both the qualitative data analysis and the quantitative data analysis. The qualitative data analysis aims to uncover or understand the bigger picture by using the data generated to describe the phenomenon and what it means (Learning, 2009). Qualitative data analysis is the range of processes and procedures whereby we move the qualitative data that has been collected into some form of
explanation, understanding or interpretation of the people and situations under investigation (Jacobsen, 2002).

The qualitative data analysis method used is a three-step model, which involves description, systematization and categorization as well as combination. Description is about creating detailed description of all the data collected through rewriting of interviews, observations as well as transcribing. Systematization and categorization are about organizing the data which is done by categorizing the content of the transcription and lastly combination, which means interpreting collected data that, is now categorized, this is done to uncover interesting aspects. This method enables planning, implementing as well as analyzing a few interviews however it’s unclear and vague as stated by (Jacobsen, 2002).

The raw data recorded on audio was transcribed after the interviews were conducted and notes from the interviews were also added to the transcripts. Furthermore, each collected data was carefully analyzed in order not to miss important details. Then the result was categorized based on various areas that were considered most relevant for the study. The data from the key informant interviews was manually analyzed; thereafter findings were integrated into a report during presentation of findings analysis.

The questionnaires survey findings were analyzed using the quantitative data analysis method, which was meant to supplement the qualitative data collected through interviews, whereby raw numbers were turned into meaningful data. All questionnaires data was field edited, coded and entered into the computer; analysis was performed using frequencies and presented using tables. Data obtained through closed-ended questions choice answer options are analysed using quantitative method and they may involve pie-charts, bar-charts and percentages. Open question questionnaires may produce unexpected results, which can make the research more original and valuable. However, it is difficult to analyse the findings (Dudovsikiy, 2016). Finally, all the data collected was organized, categorized into themes and then interpreted to find meaning (see tables in appendix A).

3.6 Validity and reliability

According to Dudovsikiy (2016) reliability means the extent to which the same answers can be obtained using the same instruments more than one time. Appropriate time scale for the study must be selected, appropriate methodology must be chosen, considering the characteristics of the study, the most suitable sample method for the study must be selected and the respondents must not be pressured in any way to select specific choices among the answer sets. Accordingly, procedures such as triangulating among different data sources, writing with detailed and thick description and taking the entire written narrative back to participants in member checking were taken in validating data collected in this research. An appropriate time was selected as suitable for this research that included different methods such as interviews and questionnaire survey to be assured that the research was valid. The suitable sample method was selected that is 50% of the elderly care homes, key informants and responds were selected as well.
3.7 Ethical Considerations

Ethics is a branch of philosophy that deals with the analysis of decisions and actions with respect to their appropriateness in a social context. Ethics is applied to many different issues in information technology (IT) and IS correspondingly to managers, teachers and students in an industry and academics (Lewis, 1985). This research carefully selected various ethical considerations as seen below;

The intended purpose of this study was explained to participants, appropriate questions were administered according to position and role, participants were given the opportunity to speak freely and decline answering any questions they did not want to, participation in the interviews was voluntary, all interviews were recorded and transcribed and the interviewees were made aware, ensuring that informed verbal permission was obtained from all the participants and there were no threats of job loss or demotion for those health workers who would have declined to participate in this study. The three principles of ethics taken into considerations were; informed consent, confidentiality and avoiding harm to do well.

4 Research findings

This chapter contains a description of the research findings from the study which focused on challenges faced by end users after the implementation of the new-HIS in elderly care homes, in a municipality in a southern region of Sweden.

4.1 Interviews research findings.

4.1.1 HISs main objective

The purpose for implementation of the new-HIS is to compile information in one place and make it readily available for the municipality authorities enabling them to monitor organization activities and compare with other municipalities.

“The municipality provides a lot of information to authorities, politicians, social services, every month in order to monitor and follow up the municipality’s activities. The enforcement officers send enforcement decisions and enforcement assignments to the organization and information about the right person and follow up the case. Other people who need the right information to do their tasks are doctors, nurses, occupational therapy, physiotherapist planners, assistant nurses, nursing assistants, etc....” (Informant A, personal communication)

4.1.2 HISs introduction

The municipality in a region in the south of Sweden was using an old health information system since 2002 prior to the existent of the new-HIS. The reasons for its decommissioning were due to the lack of IT- support from the developers and missing modules that management needed to run the municipality efficiently. Thus, through needs assessment of different sub-groups with representatives from different user
groups, they decided to procure the new-HIS as it met municipal requirements, features, the right price and support base” It is a challenge to motivate the staff to dare use the new system since people think the old system was better, the technical challenge can also play a big role…” (Informant A, personal communication).

The social welfare administration has built up user-support, and it consists of a few employees in the entire organization, assistants in the home service, section managers to mention but a few. These employees have higher qualifications and they are given skills to give support to their work colleagues. There a total of 30 employees in different roles, work as IT-support in the use of the new-HIS.

4.1.3 Organizational challenges on use of HIS
Based on interviews, enough computers should be made available so that all employees can have access to computers while at work.” The municipality has about 800 to 900 users who use new-HIS daily, we have no statistics on this, but it is estimated that there are approximately 800 to 900 users daily, i.e. week -days…” (Informant A, personal communication). The study has shown that the organization is faced by challenges to educate all the system end-users. Understanding the value of information, whereby everyone must take responsibility to use the new-HIS and why it should be used is also a challenge. “The new-HIS is a good support tool, if the healthcare staff learn how it works and motivating them to use it is also a big challenge”..., (Informant B, personal communication).

4.1.4 Intention to use
The new-HIS is the heart of all roles and duties in the organization from appointments to inpatient scheduling and others without which the organization would be at a standstill. “The social service activities are quite extensive, a lot of information is handled, for example, personal information ranging from applications, investigations, decisions, sending assignments for implementation for homecare and in this case, documentation is very important…” (Informant A, personal communication).

All tasks are online thus are carried out with usage of a computer, some participants have called for introduction of an app that eases on tools used to carry out their duties and tasks. There’s a general appreciation of new-HIS especially regarding dependency of data among all the stakeholders although some users do not input their comments and feedback as a result of lack of time due to their engaging duties, time of changeover and all computers being in use.

4.1.5 Computer skills needed to use the new-HIS
Based on the findings, no special skills are required in the use of the new-HIS. Its only computers basics required i.e. simple computer management skills where by one can operate a computer. In addition to computer skills, system end-users must attend an introduction course in order to manage the system efficiently.
“All system end-user doesn’t have basic computer management skills, the new-HIS is not difficult to use, but it would have been easier if everyone had the basic knowledge in computer management. The users find it difficult to use the new-HIS and it is because they lack skills in computer management …” (Informant B, personal communication).

4.1.6 Lack of resources
The municipalities employees are obliged to read and document in the new-HIS, and more especially when they start their daily duties, so that they get informed about what happened while they were off duty. Reading and documenting is done on computer. All employees should have access to a computer. However, the results of the study have shown that there is one computer per department, and altogether there are four computers in four separate homes. There are six people who work each pass and they should have access to a computer. The study has shown that lack of resources, such as computers as a potential hindrance to the rate of adoption. “Sometimes there are several people who want to use the computer at the same time, and these are clearly not enough…” (Informant C, personal communication).

4.1.7 Usability/ simplicity
The new-HIS is divided into different parts, these are; the sections managers' page which is used for implementation of assignments, the nurses have their page where they give delegation to nursing staff and provide medications to the resident, the nursing staff and nursing assistants have their own page where they enter and write about resident patients and the enforcement officers also have a page where they delegate assignments that are ready for enforcement. “The system should be easier to use, work better and even be more controlled so that users hardly make mistakes and staff do not experience that it is time-consuming…” (Informant A; personal communication).“The system is a bit harder for example when looking at the manager's page, it should be easier…” (Informant D; personal communication).

The results have shown that some end-users who worked in the old system are experiencing difficulties while working in the new-HIS given its long and complex procedures which makes simplicity of the system questionable.

4.1.8 Training/ learnability
Training is done using online e-learning tools, audios and manuals. These user guide manuals describe what should be done in the system. Everyone who works at the municipality should have a user’s manual i.e. new employees. The purpose of the user guide manuals is to get introduced to new-HIS and it works. Based on questionnaires survey many of the users find it difficult to use and follow the user guide manuals and thus were not appreciated. They advocate for more procedural face to face hands on training and regular refresher trainings.
“It is difficult for everyone to get face to face introduction, you have to use other methods in order to spread information such as e-learning user manuals ...” (informant A, personal communication). Based on interviews, the system administrator arranges a few training opportunities for the managers on how to use the new-HIS and make updates at the managers' meeting. The managers are also obliged to go through certain parts during the monthly meeting, with the aim at educating the staff on how the system works. Training of the new staff/ user support is done by either the system administrators or by colleagues who are knowledgeable about the system. It was noted that some participants suggest that the system owner should continue with training opportunities, providing updated information on the system and update the user manuals as well (See table 2, appendix A).

4.1.9 Other internal factors - Staff turnover

Another challenge discovered was the staff turnover that could affect use of the new-HIS. Based on the interviews there 30 user-support employees in the whole municipality who give support to other end- users in different ways. However, the results have shown that in each elderly home, there were only two employees who were trained to give support to others in the use of the new-HIS. And besides giving support to their colleagues they have also other duties such as taking care of caretakers as well. “Every time somebody leaves and a new one arrives, training must be conducted for the new end-user...” (Informant D, personal communication). New health care assistants need training that takes time to be scheduled and done besides other healthcare engagements.

4.2 Questionnaire research findings

4.2.1 Challenges faced by the HIS end-users after implementation.

Based on the questionnaire survey, the new-HIS has a search function where you search for the care recipient which helps one to find out what happened while off duty by just a click and this makes it easy to use the system according to some respondents. Although some users find it easy to use the new-HIS, others are faced by multiple challenges when performing their tasks such as inadequate time, long procedures of finding information, no data from changeover staff, long steps to complete tasks, misplaced feedback by caregivers that cannot be found where they are expected to appear or not prepared properly given the system is only accessed on the municipality intranet, time consuming and time wasting during data input as one stops to figure out which next step to take and redoing work.” The new-HIS is a one-way communication we don’t have access to all parts of the system for example nurses only have access to HSL and do not have access to SOL...” (Comments from one respondent, questionnaire empirical results). Access to the new-HIS is by username and password authentication and assigned user level duties and roles depending on the profession and level of management thus there are no clashing in roles and access to unauthorized data (See appendix A table 2...)
4.2.2 Inadequate time
Some of the respondents are challenged by the time-consuming procedures especially the nursing support staff because of their engaging tasks. These felt that the new-HIS takes up a lot of their time trying to feed in data compared to written requests that used to be faster and while they are out with the patients, they do not access patient information since the access is only via intranet. This is worsened by the lack of knowledge as one has to stop to figure out what should be input into the system thus not appreciating the new-HIS. However, others such as administrators feel that the new-HIS saves a lot of time since they can access all the necessary data all in one place, and they have access to the intranet while on duty (See appendix A table 4).

4.2.3 End user attitudes
Some end users’ attitudes were very positive towards the entire system and welcomed it because they felt that the new-HIS made their work a lot easier since the information is centralized in one place such as system administrators thus leading to acceptance, however some respondents such as nursing staff especially the older ones on the job feel that there’s no need to change the system because they were accustomed to the old one leading to rejection of the new-HIS.

4.2.4 Usefulness of the new-HIS
According to the questionnaire survey 40 percent of the end-users felt that by using new-HIS in their work, it supports them to work more effectively and improve on productivity and by so doing, they are more willing to use the system. (See appendix A table 4....) Meanwhile, others felt that it is more complicated to use the new-HIS compared to the old-HIS. Some respondents felt that the procedures used by the new-HIS are not understandable, they require proper training in order to be understood yet majority of the users do not get proper introduction because of different reasons. That’s why they advocated for more customization of the system if it’s to be more useful in their work.

4.2.5 New-HIS acceptance/ adoption
The composition of the system end-users in the elderly care department is mainly aid administrators, elderly care managers, IT-administrators, planners, nursing and nursing assistants and Care givers whose stay in the organization ranges from 1 year to 27yrs.
It was discovered that 85% of the users are satisfied with the new-HIS most especially those who have better computer skills and those with inadequate computer skills experience dissatisfaction due to the many challenges they face in using it, which in turn causes frustrations, since they feel that they don’t perform their duties as expected by their managers. Motivating the end users to adopt the new-HIS is still lacking which has very much affected the intention to use/adoption of the new-HIS according to the questionnaire findings. This is worsened by the limited training that is given to those supposed to use the new-HIS thereby affecting its overall usability since many don’t understand the purpose of the new-HIS (see appendix A table 3). The results showed that approximately 50% found the system easy to learn, about 90% of the users agreed that the system is useful, about
85% seemed satisfied with the system as well and about 60% found the system more efficient and effective compared to the old one which fulfilled the objective of the study since it responded to the research question.

4.3 Analysis of results/ findings

This section discusses the results of the interviews in relation the theoretical framework used in this case study to make meaning according to the inductive theory of reasoning.

The purpose for implementation of the new-HIS is to support health workers to do their tasks more effectively and improve productivity. Though there is a great appreciation of the new-HIS among some end-users who have positive attitudes towards use, some others question the usefulness of the new-HIS since they are not given proper introduction in the use of the new-HIS, according the interviews findings.

Absence of supportive supervision; resistance to adaptability and the support from the management of institutions remain a major concern for system acceptance. Health care professionals in management feel that the use of HIS and the offer of supervision to support staff in the use of new-HIS will take up time for their primary duties according to (Rodrigues, 2010). It was discovered in this study that the end-users lacked enough supervision according to some of the informants which has very much impacted the acceptance of the new-HIS. This left them with no choice but to prefer their handwritten notes.

One of the issues identified online training which is done using e-learning tools, audios and manuals was not appreciated since users find it difficult to use and follow and thus led to failure to appreciate the new-HIS because it appears more complicated than the old one. This is further worsened by the lack of training which has proven to be a big challenge to the acceptance and adoption of the new-HIS since users find themselves unable to use this system simply because they don’t know what to feed into the patient care plans or using the system as a whole. This study discovered that many of the staff have never been trained about the use of new-HIS, could not even define the new-HIS, some did not know what to feed into the system or how it is supposed to work. Although the attitude towards the system was positive, there was no significant difference in attitude and skills among staff. Most health organizations merely spend money on HIS, without investing in training and redesigning processes which was highlighted as a barrier to HIS acceptance. However, previous researcher such as Tossy (2014) and Avison & Fitzgerald (2002) added that training can improve IS acceptance.

It was further discovered during the study that some end-users do not input their comments and feedback as a result of lack of time due to their engaging duties, time of changeover and all computers being in use and yet the system can only be accessed on the intranet. This is in line with Hoyt et al. (2009) health care professionals claim that they don’t have time to read and learn new technologies. Change in work flows also affects their work since they were accustomed it there by leading to system rejection since they consider it time consuming.
It was also discovered that some of the challenges faced by end-users while performing their tasks are due to internal and external constraints such as lack of resources, computer shortage, inadequate time and staff turnover which is a potential hindrance to the rate of adoption. On one hand, for the acceptance of new-HIS there are ought to be availability of resources in terms of personnel, infrastructure, policies, funding, adequate computers in place for the instigation of the intention to use, Tossy, (2014). Conversely, it was intimated that factors such as poor infrastructure, lack of computers and lack of personnel are a major hindrance to new-HIS adoption. Consequently, this study discovered that there are limited resources, which is a challenge to health organizations that have inevitably moved into maximizing the value of scarce resources and find ways to make health information technology function as efficiently as possible. It further discovered that they were few computers which slowed down the technology and service delivery since new-HIS is a computerized technology system.

There is a lack of knowledgeable personnel with capabilities of using the new-HIS in the care facilities for seniors. Literature stated, given that IT projects may take long to be fully institutionalized and adopted because skills are required to build the capacity of staff to support the HIS (Ngafeeson & Sun, 2015). Inadequate skills by staff often contribute to the slow adoption of the HIS and its design. Sweden has the most seniors’ population in Europe i.e. 19.4 percent of the population is 65 years old or older (Public health agency Sweden) which has led to poor acceptance of the new-HIS since these find it hard to adopt the new technology due to the fact that their skills to use the technology are limited. The study discovered that many of the staff or end users had limited computer skills yet the new-HIS is basically a computerized technology system there by hindering its acceptance. This research revealed that poor skills possessed by the end users have very much hindered the acceptance and adoption of the new-HIS.

The usefulness of the information system is under scrutiny by some of the users who feel that because of the challenges encountered while using the HIS its effectiveness is very minimal and this has caused its slow adoption, yet others feel that the new-HIS has very much impacted on their effectiveness at work positively and are actually happy with it.

This study has also discovered paper-based information as part of the work process in the use of the new-HIS. This was criticized by Ngafeeson & Sun (2015), information written on paper may not be correctly entered into the information system leading to data mix up during the process of data entry. Although the new-HIS gives the facility right to allow the nurses to directly enter data, it is not convenient to do so. Paper based information was also seen as challenge to use which resulted in displacement of important information and affected the use of the new-HIS.

More still, the new-HIS is ineffective at providing good quality information that is convincing for managers to use to support decision making thereby affecting the usefulness of the new-HIS. This affirms the TAM; some users might reject a technology if
they discover that the technology doesn’t not enhance their job performance as cited by (Handayani et al.2017).

Resultantly, based on the information gathered, it was discovered that end-users can reject the IS due to the difficulties they find while using with the IS which can affect the perceived usefulness and behavioral intention to use the technology in question. This affirms the view about TAM that there is a relationship between usefulness and behavioral intention to use the technology as stated by (Ngafeeson& Sun, 2015). The new-HIS was characterized by a shortage of internal and external resources which very much impacted the use of technology and adoption. The health information technology has been affected by different factors which have left end-users with mixed feelings about the new-HIS thereby affecting its acceptance and adoption.

5 Discussion
This is the section where the results of the interviews and questionnaire survey are analyzed to make sense of the entire purpose for the study. It follows a theoretical analysis-based on (TAM) technology acceptance model which is included (2.4) and the results discussion in relation to the previous research which is included in the Background (1.2)

5.1 Result discussion in relation to TAM

5.1.1 Perceived usefulness
The purpose for implementation of new-HIS is to support health workers to do their tasks more effectively and improve productivity. There is a positive appreciation of new-HIS among some end-users toward its use while some end-users question the usefulness of the new-HIS since they are not given proper induction to the new system, which is to say introduction course on use of the new-HIS according to the interview findings. According to TAM user’s acceptance is influenced by perceived usefulness and perceived ease of use (Alsharo et al. 2018). These behaviors are also explained by TAM, therefore according to the results, end users’ attitudes are influenced by the perceived usefulness. The usefulness of the system is under scrutiny by some of the users who feel that because of the many challenges encountered while using the system, its effectiveness is very minimal thus its slow adoption, yet others feel that the system has very much impacted on their effectiveness at work positively and are satisfied with it. According to TAM perceived usefulness is key to system acceptance and this was discovered in this study as well.

5.1.2 Perceived ease of use
The results show that computer competent staffs were satisfied with the system because they found it easy to use leading to user acceptance. While those with inadequate computer skills experienced dissatisfaction due to challenges faced while interfacing with
the system resulting in system rejection. These behaviors are better explained by TAM, which has been used in healthcare to identify factors that relate to user acceptance and how they are related to each other. The training about the system is done basing on online e-learning tools, Audios and Manuals which the users find difficult to use and follow and thus don’t appreciate. Therefore, end-users rejected the system due to difficulties they find while learning how to use the new-HIS which can affect the perceived usefulness and behavioral intention to use the system. The theory used in this study TAM states that perceived ease of use is very important when it comes to technology acceptance which is in line with what this study discovered that users who find the system easy to use such as system administrators easily accepted and adopted new-HIS while those who had challenges using the system easily rejected it for example managers who find complexity in using the new-HIS. There is a relationship between perceived usefulness and the behavioral intention to use the system as cited by (Ngafeeson & Sun, 2015).

5.1.3 Internal and external constraints
Other internal and external constraints were also discovered such as lack of resources, lack of motivation, lack of supportive supervision, staff turnover and healthcare work complexity. These are directly related to both behavioral intentions to use and actualize the new-HIS as stated by (Ngafeeson & Sun, 2015).

5.2 Results discussion in relation to the previous research
The result has shown that some of the challenges faced by the users were based on organizational failures which in turn led to the rejection of new-HIS thus slower adoption. Lack of resources was highlighted as a major challenge faced by the organization such as computer shortage, inadequate time, lack of IT-support, lack of desired skills to mention but a few. These results correspond to previous research as shown below.

5.2.1 Supportive supervision
Absence of supportive supervision; resistance to adaptability and support from management of institutions remain a major concern for system acceptance. As mentioned above in the results chapter. The result has clearly shown lack of management support was a major obstacle towards the use and acceptance of the new-HIS. Thus, the results that have emerged have confirmed other previous researcher’s theory in information systems use and acceptance. This is cited in the works of Rodrigues (2010) which clearly shows that management simply have no time to support the end-user which was also discovered in this study that the end users lacked enough supervision according to some of the informants which has very much impacted the acceptance of the system. Therefore, more supervision should be given to users and simplified procedures which do not require much supervision.

5.2.2 Training
The results identified that training about the system is done online using e-learning tools, audios and user manuals guides that users find difficult to use and follow and thus failure
to appreciate the system because it appears more complicated. It was further discovered that many of the staff had never been trained about the use of the new-HIS, could not define it, some did not know what to feed into the new-HIS or how it is supposed to work. The result has shown lack of training has been highlighted as one of the challenges faced of which has hindered adoption and acceptance as well. Therefore, the results are in line with other previous researchers, (Tossy, 2014) has also highlighted training as a barrier to HIS acceptance, Avison & Fitzgerald (2002) has noted that training can improve IS acceptance. The study discovered that training regarding the new-HIS is still wanting and yet it’s very pivotal when it comes to technology acceptance which is suggested by (Avison & Fitzgerald 2002). This was in confirmation to Davies (2009) who states that the context of use of an information system is defined by the usability or how easy it is to use the system. Therefore, it is recommended that the system should be simplified such that it’s easier to use by all stakeholders who will impact its rate of adoption and acceptance positively. Therefore, more face to face trainings should be carried out and training materials should be simplified to enable end users appreciate the system more which will eventually lead to acceptance.

5.2.3 Inadequate skills
This study discovered that many of the staff or end users had limited computer skills yet the new-HIS is basically a computerized system there by hindering its acceptance and also revealed that poor skills possessed by the end-users have very much hindered the acceptance and adoption of the new-HIS which is in agreement with (Ngafeeson & Sun, 2015). Literature stated that elderly care institutions IT competences, therefore IT projects may take long to be fully institutionalized and adopted because IT skills are required to build the capacity of staff to support the new-HIS (Ngafeeson & Sun, 2015). More training and refresher courses should be given to staff and more customization of the system. Short courses for health professionals and continuous medical education programs should also be provided on health information management. Inadequate skills by staff often contribute to the slow adoption of new-HIS and its design.

5.2.4 Inadequate Time
The results have shown that due to inadequate time some users do not input their comments and feedback and while they are engaged with other duties. This is in line with Hoyt et al. (2009), who intimated that health care professionals claim that they don’t have time to read and learn new technologies.
It was also found out that change in work flows also affects their work since they were accustomed to handwritten notes there by leading to system rejection since they consider it time consuming. This has confirmed Tossy (2014) findings, that availability of resources in terms of personnel, enough time to mention but a few is critical for the adoption and intention to use. These could be one of the biggest challenges if acceptance of new-HIS must take place. If change must take place enough resources should be available and simplified procedures are therefore recommended so that the system is less time consuming in order to improve acceptance of the new-HISs.
5.2.5 Internal and external constraints

Internal and external constraints such as lack of resources staff turnover was also discovered as a major challenge of which has hindered the rate of adoption and acceptance. This is in line with what Tossy, (2014) stated that availability of resources in terms of personnel, infrastructure, policies, funding, computers in place for the adoption and intention to use could be one of the biggest challenges if acceptance of new-HIS must take place. The results have shown limited resources, which is a challenge to health organizations that have inevitably moved into maximizing the value of scarce resources. It further discovered that they were few computers which slowed down the system and service delivery since new-HIS is a computerized system. Tossy, (2014) highlighted that factors such as poor infrastructure, lack of computers and lack of personnel are a major hindrance to HIS adoption. The system is only found on the municipality intranet which hinders usage and implementation. The policies in place were also inadequate in promoting new-HIS acceptance, therefore policies should be reviewed to consider putting new-HIS on the internet to make it easily accessible to better utilize the system. More financial support in terms of finance and computers should also be considered.

5.2.6 Intention to use

The major objective of this study was to examine the challenges faced by the users of the new-HIS at elderly care homes in one municipality in a region in the south of Sweden after its implementation. The results that has emerged has shown that the study has have fulfilled the objective of the study since it has responded to the research question. The major part of the study has confirmed previous researchers’ theories in the field of information system and use and new theories have been also discovered such as internal and external factors such as personnel turnover as an obstacle to system adoption. Although Health Information systems have proved to be beneficial in solving the impediments of quality healthcare service, implementation efforts are failing in a major way due to the complexity of the healthcare environment and professionals’ resistance to adopt the technology (Heeks et al. 1999). This is in line with what was discovered during the study, the municipality procured the new-HIS in order to enhance quality care, but it’s evident in our findings that due to many challenges faced such as limited resources, the expected results have not yet been achieved. The results have shown that some users with better computer skills accepted the system, while those who had limited skills rejected the system due to difficulties they find while interfacing with the system which can affect the perceived usefulness and behavioral intention to use the system under investigation. The users with better computer skills can easily accept the system and those with limited skills can reject to use the system as cited by Ngafeeson & Sun (2015) This affirms the TAM perspective that there is a relationship between usefulness and behavioral intention to use the system.

Sweden’s vision 2025 is to be the best in the world at using the opportunities offered by digitization and e-Health. This will make it easier for people in Sweden to achieve equal health and to develop and strengthen their own resources for increased independence and
participation in the life of society (Social department 2010). Various scholars in addition have also highlighted many opportunities of HIS which might contribute to quality care, that aside, previous researches such as Heeks et al. (1999) and (Alsharo et al. 2018) identified the complexity of healthcare environment as an obstacle to adoption and acceptance of new-HISs, i.e. healthcare professionals’ according to Alsharo et al. (2018) are reluctant to use of HIS. This is better explained by TAM which reflects on internal and external constraints of behavior and is directly related to both behavioral intentions to use and actualize. In this case the complexity of the healthcare environment is seen as the external constraint of which has hindered the use and acceptance as well.

5.2.7 Paper based information
This study discovered that the new-HIS is ineffective at providing good quality information that is convincing for managers to use to support decision making thereby affecting the usefulness of the system. Data handling procedures are a problem where system end-users end up feeding in wrong information or not inputting information at all leading to ineffectiveness. Therefore, the study recommends that data handling procedures should be standardized for better utilization of the system and makes the procedures more user friendly in order to improve the usefulness. The study discovered that few staff are trained in the utilization of new-HIS data tools and there were non-standardized tools for data recording and reporting which has compromised the effectiveness of the new-HIS. Data handling procedures are a problem where users end up feeding in wrong information or not inputting information at all leading to ineffectiveness. Therefore, the study recommends that data handling procedures should be standardized to better utilize the new-HIS which also makes the procedures more user friendly in order to improve usefulness.

5.3 Method reflection
The mixed method used in this study was the best approach suitable for the study and has contributed to a broader coverage and a deeper understanding of the challenges faced by the end-users of new-HIS. This approach has contributed to gathering of both qualitative and quantitative data and analysis was based on the combined strengths of both sets of data to understand the challenges faced by the end-users of the new-HIS.

The qualitative exploration method and the qualitative data findings were used to develop a new intervention for use in a quantitative experimentation. This was the most suitable method because of its flexibility; it provided different approaches depending on the collected data. The in-depth interview with help of unstructured or semi-structured response options allows a description of a problem from informant’s perspective which provides nuances and unique understanding of phenomenon. The qualitative method provides richer data which can be used to understand the intention behind the action making it a suitable approach to understand the intention to use/ reject of the new-HIS. However, the qualitative method has limitations, it’s applied when a few units are investigated, and results cannot be generalized for a larger population.
In this study a quantitative method was also applied using the questionnaire survey, the quantitative questionnaire method was used within the municipality and therefore the results from this study are limited to the municipality in a region in the south of Sweden. The main objective of the questionnaire survey was to get a broader understanding of the challenges faced by end users of the new-HIS within the municipality in a region in the south of Sweden. The mixed method approach was suitable for this research; the qualitative data collection and analysis is supported by the quantitative data to acquire both a broader and deeper understanding of the challenges faced by the end user of new-HIS within the municipality in a region in the south of Sweden. This was the best approach suitable for this research because it gave direct interaction with the staff in some of the elderly homes in a Southern region of Sweden. However, this method is time consuming and is difficult to transform qualitative data into new variables of interventions.

6 Summary

The purpose of this study was to examine the challenges faced by the end-users of the new-HIS after its implementation, in the elderly care homes in a municipality in a region in the south of Sweden. Mixed methods are utilized to conduct the case study; semi-structured interviews and questionnaire survey. According to the previous research of this study, it was discovered that when an organization implements a new system, there are key factors that need to be considered prior to the introduction of the new system; such as simplicity, learnability, usability among others which very much impact on the general acceptance of the implemented system. This is further emphasized by TAM which is the model used in this study, factors such as perceived ease of use and perceived usefulness of the system yet to be introduced which is no different from HIS. The acceptance of the new-HIS was no different whereby it was faced with many challenges both internal and external to its adoption; such as resistance from users especially those who have been around longer and are accustomed to a certain way of doing things. In this case, in elderly care homes, the negative attitude of users has very much slowed down the adoption and acceptance of the new-HIS in general. About 90% of users of the new-HIS according to our survey felt that the new-HIS would be of great help when performing their duties to execute them more effectively if it would be fully accepted. While examining the challenges faced by end users of the new-HIS after implementation, the (TAM) technology acceptance model was applied to deeply understand the challenges facing the adoption and acceptance of the new-HIS.

6.1 Conclusion

The study’s major objective was to understand the challenges faced by end-users after the implementation of the new-HIS; the theoretical framework, TAM –Technology acceptance model has been used in this study for examining the current HIS and underpin the challenges users face after implementation of the new system that inhibit its adoption
and acceptance. The two key factors of perceived ease of use and perceived usefulness have given us an insight and opened the deep intrinsic information about system use and adoption. The Mixed methods are utilized to conduct the case study; semi structured interviews and questionnaire survey.

The findings of this study are a result of interviews conducted with the end users of various departments in the elderly care homes and through a questionnaire survey by end-users. The gathered data has been organized and thematically presented in form of tables in this report for clarity. The theoretical framework and analyzed data have revealed challenges faced by users of new-HIS after its implementation. The results showed that approximately 50% found the system easy to learn, about 90% of the users agreed that the system is useful, about 85% seemed satisfied with the system as well and about 60% found the system more efficient and effective compared to the old one which fulfilled the objective of the study since it has responded to the research question. I envisage that the knowledge gathered during this study can resonate the findings that challenges tend to manifest from usability and learnability of the new system. Therefore, it’s my hope that this study largely contributes to the field of the new HISs.

6.2 Future work

Further research that can be conducted based on this study is to investigate the effects of these challenges faced by end-users in use of new-HIS acceptance and adoption. Since the study examined the challenges users face while interfacing with new-HIS, it may be important to examine the effects of these challenges on system adoption. Furthermore, research should be conducted on how these challenges can be overcome in order to accelerate new-HIS acceptance and adoption even in other municipalities in order to validate the study’s results and thus can be able to generalize the results to a greater extent
References


Davies, P. B. (2009). Business information systems. Published by PALGRAVE MACMILLA


Appendix A: questionnaire results /table 1

ease of use/learnability

- Easy To Learn
- Easy To Feed in Data
- Understandable
- Computer Skills

- Yes
- No
- Avg.
Appendix: A questionnaire results /table 2
Appendix: A questionnaire results /table 3
Appendix A: questionnaire results /table 4
Appendix B: Interview questions

**System owner / project manager**
- What is your role in implementation?
- What are the main reasons for the data/information?
- Why is this information system implemented?
- Who needs (stakeholders) the information captured by the information system?
- Are there routines meant to increase efficiency in daily activity?
- What is the expected functionality of the information system?
- How can new-HIS facilitate the management of elderly care?
- Who can users turn to when it comes to IT support?
- What challenges do you face in implementing IS?
- What are the expectations of the new-HIS? i.e. effectivity / productivity

**Elderly home managers / IT – personal**
- How long have you been working in the elderly healthcare home?
- Describe new-HIS?
- Describe who uses the new-HIS?
- What computer skills do you need to use HIS?
- How is the new-HIS accessed?
- Do all employees have access to a computer to perform their tasks?
- Is the system always running?
- What happens when the system is turned off?
- Do you have routines or technical structures that facilitate the use of the system?
- Who can users turn to when it comes to IT support? What are the usual complaints from system users?
- What challenges are you facing while using new-HIS?
- How can you describe the safety of new-HIS, especially when it comes to patient data sensitivity?
- Any other comments or suggestions?
- Are users given induction courses regarding the use of new-HIS?
- How is training done?

**System owner/project manager**
- Why is this information system implemented?
- Who needs (stakeholders) the information captured by the information system?
- Are there routines meant to increase efficiency in daily activity?
- What is the expected functionality of the information system?
- How can IS facilitating the management of elderly care?
- Who can users turn to when it comes to IT support?
What challenges do you face in implementing new-HIS?
How you like would new-HIS to function?

Appendix c: questionnaire survey questions

Introduction question
Age
What is your profession?
How long have you worked in the elderly healthcare homes?

Learnability
Is it easy to learn system use?
Is it easy to understand system functions?
Do you have good computer skills?

Supervision/support
Do you have computer support at work in your daily tasks?
Do you get help from your colleagues to use the system?
Do you understand that the system contributes to effectiveness in my healthcare work?
Did u attend IS introduction course
Do you have access to system IT- learning?
Did you get enough introduction to use the system correctly?
Do you have access to system introduction manuals?
Do have enough computers in your elderly care homes?
Is it easy to find routines and blankets in the system?

Usability
Is it easy to use the system?
Is it easy to feed in information into the system?
How is data collected and accessed?
Does the system improve your efficiency at work?
Is your work dependent on another’s input into the system?
Describe if anything, what happens when you don’t get access to the information you need to pursue your task?
What are the main purposes of available computers?
Which measures do you take when the system is out of order?

Intention for use /use
Does your boss expect you to use the new system?
How often do you use the system?