NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF BUSINESS ADMINISTRATION

HIMSS PUBLIC INVESTIGATION OF THE FACTORS AFFECTING THE ADOPTION AND USE OF HEALTH INFORMATION TECHNOLOGIES IN HOSPITAL ENTERPRISES FROM THE PERSPECTIVE OF UNIFIED TECHNOLOGY ACCEPTANCE AND USE THEORY

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PHD. THESIS

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ARZU BÜLBÜL tarafından hazırlanan “HİMSS Public İnvestigation of the Factors Affecting the Adoption and Use of Health İnformation Technologies in Hospital Enterprises From the Perspective of Unified Technology Acceptance and Use Theory” başlıklı bu çalışma, 25 /01 / 2021 tarihinde yapılan savunma sınavı sonucunda başarılı bulunarak jürimiz tarafından Yüksek Lisans / Doktora / Sanatta Yeterlik Tezi
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BİLDİRİM

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- ☐ Tezimin tamamı heryerden erişime açılabilir.
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ABSTRACT

Examination of the factors affecting the acceptance and use of health information technologies in HIMSS public hospital enterprises from the perspective of Unified Technology Acceptance and Use Theory

The first phase in digitizing hospitals is to develop advanced, efficient, stable, complex hospital information management system software that can be integrated with all hospital systems and units. Afterwards, it is necessary to ensure that the processes of change, renewal and adaptation of this system are managed and finally to support the process with in-service training and incentives for sustainability.

This study, Turkey in HIMSS Stage 6-7 certified health information technology adoption in the first of two city hospitals and health professionals was carried out to determine its use as effective. The research model presented was based on UTAUT. According to UTAUT, the models incorporated within the UTAUT framework include determining factors that directly affect its intent or use. Shows that increasing HIT service quality and efficacy and using health technologies to improve services are positively affected by the users' performance expectation, expectation of effort, social impact and trust perception. While there is concern about the problems in using HIT, it is stated that due to the competent user education level learning to use technology and integration into the system will be fast.

HIMSS standards are followed in European countries extensively in digitalization. Considering the HIMSS stage-6 and 7, in total Turkish hospitals have totally 68% share in this area. In our research, measuring the adoption and use of this new system by healthcare professionals of the first public city-hospitals to receive stage-6 and stage-7, is important in terms of contributing to the literature.

Keywords: Health ınformation technology, ınformation technologies, acceptance technologies, hospital technologies.

TABLE OF CONTENTS

FIGURES INDEX

TABLES INDEX

INTRODUCTION

The widespread use of information technologies in medicine and health has led to a redefinition of its mission. For this reason, the interaction and communication between people and computers is becoming increasingly important in medicine and healthcare services. Computer use requires new skills such as employees' ability to acquire and apply training, theoretical and analytical information, a different approach, and a continuous learning habit. The first step in the digitalization process of hospitals is to develop advanced, efficient, stable, complex hospital information management system software that can work integrated with all hospital systems and units, and then to provide a very good management of the change, renewal, adaptation processes of this system, and finally in-service trainings for sustainability, to support the process with incentives. HIMSS standards across the world are being followed in European countries with the intensity of digitalization and Turkey has a 68% share in this area with its hospitals in HIMSS Stage 6 and 7. In our study, measuring the acceptance and use of this new system of health professionals in the first City hospitals receiving stage-6 and stage-7 gains importance in terms of contributing to the literature.

It is known that researches on information technology investments, such as “Enterprise Resource Planning (ERP)”, provide strategic and abstract benefits to businesses that will improve their operational activities in the long term. Health institutions are among the important institutions that respond to the vital needs of societies. With the development of health practices, the integration of information technologies into these institutions enables the activities to reach higher levels. In addition to the developments in health practices, information technologies are developing day by day and therefore act as a triggering factor in the realization of public reforms in the countries (Kavuncubasi, 2000).

It is suggested that one of the areas of mandatory improvement in health will be the effective use of information technologies. In the provision of health services; methods of health informatics and information technology examination, diagnosis-treatment, education, communication, data processing and management, medical decision

making and scientific analysis are used. One of the most important problems encountered at this stage is the adoption and acceptance of healthcare professionals who are healthcare practitioners. No matter how powerful the applications and software are, it is suggested that the success levels are limited to the knowledge and experience levels of health users and managers, and one of the areas of compulsory health improvement will be the effective use of information technologies (Ak, 2009).
With the reforms in health institutions, it is aimed to adopt new understandings and use various health information technology systems, to increase the quality of health services and to reduce costs to a minimum level. The inclusion of new applications in information technologies in healthcare institutions is a positive practice, as well as the fact that detailed information about these systems is less than it should be an important problem (Cynthia et al., 2015).

Information technology can manage endless information, similar to physical objects. This makes it easier to make decisions and coordinate. Looking at the present day, it is seen that the countries where information is used intensely are strong. With information technologies, power is obtained and the information available is enhanced and consolidated and disseminated. Businesses seem to engage with uncertain and complex environments to use information effectively and be strong against competitors. Information technologies are also used to minimize these uncertainties in the environment. It also guarantees the responsiveness of information technologies to the environment, and the rapid response to requests from external environmental factors (Koza, 2010).

The widespread application of Healthcare Information Technologies has revealed that organizations can only achieve sustainable competitive advantage through “management of information and information”. The need for organizations to have more strategic thinking structures in these processes is another issue. Today, especially fast processors, developing database software and internet technologies have a significant impact on the strategic decisions of management levels. The managers responsible for information technology practices should be conscious about this situation and the relevant stakeholders should be included in the process before determining the technical preferences in organizational practices (Charo and Marlei, 2011).

Otherwise, the problems of individuals using information technologies will not be detected and instant problems will not be taken into consideration and more complicated problems may arise in the future. Accurate and proper use of Health Information Technology (HIT) has accelerated with the potential to increase productivity, reduce costs, reduce medication errors and alleviate the manpower burden in the health sector.

The study model UTAUT contains three variables developed by Venkatesh, which are considered to be factors that determine intent to behave. These are stated as performance expectations, effort expectations and social impact. UTAUT model has been successfully applied in the studies of health sector technologies including information and information systems, healthcare enterprises and tele-health care services. The UTAUT model has proven to have good predictability (Venkatesh et al., 2003).

Evaluation of user intent and behavior is the main component of information technologies. When the processes to be performed and the information technology equipment on which they work are required, it will not reflect the realities of the process when it is put into practice without knowing what effect the users will have. The prominent stakeholder here is to reveal the current situation of “human-employee” and to predict and implement what needs to be done in applications and processes.

The study is to examine the variables of performance expectation, effort expectation, social impact and facilitating conditions that affect the acceptance and use of existing information technologies. The research model is based on the Unified Technology Acceptance and Use Theory (UTAUT). UTAUT covers the determining factors that directly affect intent or use in models combined within its framework. These determining factors were determined as performance expectations, effort expectations, social impact and facilitating conditions. These factors play an important role as direct determinants of user acceptance and usage behavior. The aim of the study; is to try to predict the individual's intention to adapt to a particular system or technology within the framework of the determining factors presented.

This study examines the variables related to the use and acceptance of health information technologies with the participation of 1000 personnel, who are doctors, nurses, midwives, x-ray technicians, anesthesiologists, laboratory technicians from Yozgat City Hospital, which is operated with investment-financing model, one of the first projects for new city hospital which provides secondary and tertiary health care services under the authority of the Ministry of Health of Turkey Public Hospitals, with an investment period of 2 years, operation period of 25 years, 475 bed capacity, 110 personnel and Isparta City Hospital, which was opened to service with 780 bed capacity and 2687 personnel.

- Two hospital employees using the HIMSS module were ready for health information technology and were able to use them effectively.
- Two hospital employees using the HIMSS module were ready for health information technology and were not able to use them effectively.

The literature appropriate for the subject and purpose of the research has been scanned and a questionnaire that will reveal the hospital healthcare workers personal information form, the skills of using the information system and the areas where the benefit of the system is predicted has been developed. The questionnaire includes 50 questions including 6 related to personal information together with descriptive information of healthcare workers, 44 related to the dependent and independent variables including information technology-related knowledge levels, benefits of information system, hospital information system usage skills.

The data obtained with the scale were transferred to the computer environment and the analysis of the data was done using the SPSS package program. The reliability of the survey was calculated according to the Cronbach Alpha coefficient. Among the variables, Chi-square Test, T test and Variance Analysis were used. The relationship between the research data and dependent and independent variables was examined and interpreted. In independent group comparisons such as socio-demographic variables, t-test, one-way analysis of variance for continuous variables, and appropriate options from Post hoc tests were used to determine the significance of meaningful results. $P < 0.05$ was considered statistically significant in all analyzes.

In the study it has been aimed to find out how the demographic variables and levels such as gender, age, marital status, department, occupation, tenure in the profession, work period in the hospital and educational status of occupational groups such as physicians, nurses, midwives, X-ray technicians, anesthesia technicians and lab technicians working in the first city hospitals in Turkey with a HIMSS stage 6-7 have an impact on individual performance, how corrective measures can be taken by the hospital managers as a result of this effect, and solutions for similar issues affecting the general performance of the hospital. In addition, it will be aimed to determine the intent and behavior levels of the information and infrastructure of the hospital and the acceptance and usage of the managers, doctors, nurses, laboratory staff and technicians regarding the information technologies.

The results of this research can increase the quality and performance of the hospital by improving the acceptance and use of information technologies of physicians, nurses, midwives, x-ray technicians, anesthesiologists, laboratory technicians who are actively involved in the conduct of the hospital's activities. In addition, measures are taken in areas that are needed to increase the performance, quality, efficiency and the necessary materials - equipment, infrastructure, in-service training and certificate programs for the sustainability of the Ministry of Health within the scope of macro policies and the public hospital administrations within the scope of micro policies.

CHAPTER 1.
INFORMATION TECHNOLOGIES

Information technologies (IT), which is developing in the last century in the world, is developing its field of activity day by day. Information technologies used in the fields of military, medicine, aviation, space or mathematics are used very frequently in many businesses and especially in all departments of the health sector. In order to adapt IT to the department or sector that needs to be applied successfully, its scope should be known and coordination should be organized accordingly (Lutwak, 2014; Brida, Izquierdo and Aguirre, 2016; Jacquez et al. 2019).

1.1. The Concept of Informatics

The concept of informatics is one of the main factors that make up the phenomenon in IT. Accordingly, the concept of informatics is a science that is preferred in communication in various fields, and that it enables organizing all kinds of data and information in a certain systematic. In order for the concept of IT to exist, the concept of informatics must exist and the concept of data-information must exist in order to be in question. Because the raw material processed in informatics (analysis, archive, tracking, etc.) is actually data and information. Data are objective, fully provable facts related to actions, recording the transactions to be done without structuring, and information is the data processed and organized in a certain order. As it can be understood from the definitions, the concept of informatics is a whole of work-organizations made for the purpose of determining the data required for a purpose and making this data usable and carrying the information feature. In short, it is the process in which the information is obtained professionally and processed in the same way. If the concept of informatics alone is considered, the data cannot be determined correctly due to the lack of technology; it will be quite difficult to take it to the information stage by evaluating it and it will be a whole process that can take a long time (Barutçugil, 2002).

1.2. The Concept of Technology

Although the concept of technology has come from the existence of humanity like knowledge, it has emerged as a whole of constantly developing formations recently. So much so that the concept of technology can determine the factors of winning and losing countries in wars and make permanent and concrete changes on the way of life of societies. The methods that people apply to the substances in the environment in order to meet these needs in line with their personal needs are also included in the concept of technology (McClean & Dorn, 2013).

1.3. Information and Technology

A circular relationship between science and technology can be mentioned. It is possible to say that the production of information that will be suitable in terms of application of scientific studies, in the stage of preparing the technological developments, technological developments also accelerate scientific developments by ensuring that scientific studies are carried out under suitable conditions. After the use of computers in the 1950s, the cycle time in the science-technology relationship has been shortened. The fact that computers are gaining strength day by day is not only that powerful computers speed up current research. In addition, it has revealed new fields of knowledge with studies that were not possible before (McClean & Dorn, 2013).

1.4. Information and Technology Development

It is an important process that technological products, which started electronically in 1946, spread rapidly throughout the world. In this case, it is possible to say that none of the industrial productions have been experienced so fast before. It is an important detail that the computers, which weighed approximately thirty tons at the beginning, are small enough to enter our pocket today (Akın, 1998: 43). In the last forty-fifty years, there have been important developments regarding the usage areas of computers in data processing and providing information in organizations. It is obvious that the processing of data has become more reliable, faster and cheaper regarding the developments in computer technology. Regarding the developments in microelectronics technology, the use of microcomputers in businesses has also become widespread as a result of the smaller size of computers and their performance increase (Baines & Haslam, 2005; Büyükcapar, 2018).

1.4.1. Data Processing Period

The Data Processing Period is also used as the Automation step. During this period, business processes were automated with the use of data equipment, and the need for people also decreased. Nolan and Croson (1995) listed the characteristics of this period as follows:

- It covers the period between 1960-1980.
- The functioning level of the system is automated with various programs.
- There are portfolio applications that cover millions of lines of code.

1.4.2. Micro Period

The Micro Period covers the cognization and internalization steps. In the cognization step, it is seen that it is not possible to transfer the information tasks of the senior staff to lower level staff depending on automation. In this context, it is an important step to develop and use the information processor and desktop computers at the tables of middle and senior executives that draw their power from the main computer. It is possible to list the characteristics of this step as follows (Nolan and Croson, 1995):

- It covers the period between 1980-1995.
- User-oriented software such as word processors, charts, spreadsheets and Computer Aided Design (CAD)/Computer Aided Manufacturing (CAM) has emerged.
- Microcomputer usage and software sales,
- Sales of user software, almost all of which are purchased from other businesses, covering millions of lines of code

1.4.3. Network Period

In the networking period, things are organized as networks. The network environment, which has occurred thanks to the data processing period firstly with the terminals realized and secondly the micro period with the processors and the electronic connection technologies, emerged as an integral. With both internal and external network connections, businesses expand their asset areas and provide access to brand new areas. During this period when networks were being used

effectively through the internet, many possibilities such as card banking transactions, internet banking, mobile payment via POS devices have been introduced to the customers and developments such as interactive television, voice and video communication have been experienced (Nolan and Croson, 1995).

1.4.6. Cloud Technologies

Cloud technologies refer to the period when the impact of smart devices other than IT gradually increased. This period is emerging with the increase of devices that spread rapidly and communicate with each other all over the world. As many components of technology are developing day by day, one of them is cloud based developments. Cloud technologies are important developments due to their many features such as the ability to store data in a virtual environment and access it from different locations. Cloud technologies can be applied in many sectors such as health, food and economy without business size difference (Singh et al., 2015; Kaya, 2017; Wang et al., 2016; Bayin, Yesilaydin & Ozkan, 2016; Metin, 2017).

It is inevitable that cloud computing becomes widespread in this period. So much so that access to data, real-time video, multi-attendance teleconferencing, web browsing, messaging, and e-mail can be realized through cloud applications. Within the scope of cloud applications, it has become commonplace with cloud technologies to access, produce, organize and share content that can be stored centrally or locally, and to manage from the center. In addition, it has been stated that the application of corporate IT will go beyond desktop computers in the near future, with flexible working and employee mobility becoming prominent nowadays, institutions and organizations turn to tablet technologies, and the equipment purchased by people is used partially for business. One of the most important contributions of cloud technologies in all these processes is the ability to provide access to any content within the IT systems of the institution from anywhere inside or outside the organization (Zelenay, Balco & Gregus, 2019; Wang, 2017).

1.5. Information Technologies Applications

The concept of Information Technologies applications refers to the methods, techniques and processes related to Information Technologies that may be needed to create values in information technologies. Tippins and Sohi (2003) expressed IT as

the application degrees of the firms to manage information about their markets and consumers in IT applications. It is also explained by Lopez, Peon and Ordas (2009) as using IT to increase the effective status of organizations and make decisions in a way similar to the definitions here. It is defined in the sense that Information Technologies applications are one of the supreme clusters of all services and processes that are provided by the Information Technologies staff to both their external and internal consumers and to continue their business as a company.

In many definitions, it has been mentioned that the information and infrastructures that play an important role in IT applications have been realized and their performance has increased according to the contribution of these factors. It is the ability of companies to know computer systems in order to analyze and emphasize market information about their consumers by using information systems, and to know market systems in the bases of external data. In addition, the fact that companies establish procedures to collect consumer data from online (internet) bibliographies, use a computer infrastructure system to collect, store, process, analyze and use market and customer information, as well as frequently use support systems for decisions in order to manage customers' information; is the indicator that companies have implemented Information Technologies applications (Tippins & Sohi, 2003; Lopez, Peon & Ordas, 2009; Büyükcapar, 2018)

1.6. Information Systems

The advantages of IT developments to the development of information systems (IS) take place in exciting and dynamic activities for today's modernized organization groups. In order to evaluate the strategic advantages of IT to organizations, it is first necessary to understand and know the roles of IS in organizations. IS is in support of the functions of organizations to make decisions that are among their main processes in their management. The objectives of the information are to minimize uncertainties regarding future events or situations, while the objectives of the information system are to provide the information, they need in making decisions in general (Bensghir, 1996).

IS can be defined as the cluster systems of the information needed to collect, store, process, distribute, decide and transmit the information within the systems that

owned by other systems, as well as the systems under which they belong to another and larger system. IS can also be defined in the form of computer systems that have been made for storing and accessing data and that have to use management systems with a database in general. The processes processed in the formation of information in IS can be gathered in five different ways; process, input, storage, output and distribution (Omurbek & Altin, 2009).

1.6.1. Information Systems as Open System

Open systems are systems that have interactions with the outside environment. By taking certain inputs from external factors, they give certain outputs to the environmental factor again after their processed state. IS contains a classic open system feature within itself. As seen in the same organizations, IS is included in completely open systems. The point to be drawn attention here is that IS expresses more meanings than one sub-section within the organization system; and that it is understood that the same Organization System has become the main skeletons. Although the organization and the IS can be handled differently; considering the organizations of a reasonable business recently, both of the cases here have to form each other by interlacing (Bensghir, 1996; Omurbek and Altin, 2009).

1.6.2. Information Systems Categories

On behalf of organizational systems, a single operating system state cannot allow all of the different requirements from varying levels. For this reason, it is very important to create IS that make a difference for all organization systems that make a difference. In addition, the organization is divided into levels such as:

i. Strategy Level Systems
ii. Administrative level Systems
iii. Informational Level Systems
iv. Operating Level Systems

that vary as above, and then into variable situations such as finance, marketing, human resources, and accounting. Different IS are developed on behalf of all the levels here, with their own special cases (Jhigh, 2013; Tona and Carlsson, 2014).

1.6.2.1. Operational Process Systems

Operational Process Systems or Recording/Data Processing Systems is the name given to computer-based systems that help organizations do daily work at the operational level. In the operational process, the functions and objectives of the systems are generally planned in advance. It is possible to say that the decisions taken at this level are structural decisions rather than administrative ones. However, it can also be named as planned decisions, because they are above predetermined decisions (Joseph, 2003).

1.6.2.2. Information Processing and Office Automation Systems

Information Processing Systems are designed to meet the information needs of information-intensive employees. Office automation systems, on the other hand, are data systems applications that aim to increase the productivity of the data processors within the office. Information-intensive employees with certain professional qualifications produce new information on behalf of the organization and use their information processing systems to achieve their organizational goals. Systems developed for using this level are information processing systems. In addition, data-intensive employees are concerned with the processing of data rather than producing information. Office automation systems used by data workers also support the programs of the workflow, document management and communication (Türkdönmez, 2014).

1.6.2.3. Management Information Systems

Management Information Systems (MIS) serves from the organizational level to the administrative level. It presents the reports to the managers with a performance evaluation of the past and the day. MIS has basics of planning, decision making, implementation and control and also provides support to the mid-level executive level (Laudon & Laudon, 2018; Tahirov, 2009).

1.6.2.3. Decision Support Systems

The system, which is used to support decisions, is at the management level of the organizations. Generally, BS that helps in the decision-making process can also be called Decision Support Systems. Compared to MIS, it has a more flexible structure. Therefore, it can be easily adapted. It is also a BS that can quickly provide feedback.

Users can easily control the input and output. It is designed for managers and does not require the ability to use professional programs. Those who use this system are more advantageous than those who do not. It is possible to list the reasons for this:

- Profitability is high.
- Profitability is more stable; varies little over time.
- Time to reach decisions is short.
- Fewer alternatives are considered.
- It has the opportunity to explain its decisions reasonably (Laudon and Laudon, 2018; Tahirov, 2009; Bensghir, 1996).

1.6.2.4. Executive Information Systems

Executive Information Systems (EIS) is designed to support advanced communication technologies and managerial decisions of strategic level managers with advanced graphic and table designs. In addition to collecting external environmental data, EIS can also capture internal environmental data. This system, which is used by executive managers, is designed according to the requirement of the manager, besides being easy to use. Thus, it is preferable for managers to use these systems without seeking help from any specialist. The system is an IS that is adequately qualified to provide the outputs required to achieve critical success factors that will enable things to run smoothly or cause complete bankruptcy within an organization. They are designed to support managers in strategic management issues within the organization (Laudon and Laudon, 2018; Joseph, 2006; Bensghir, 1996).

CHAPTER 2

2.1. Health Informatics

Discussions on the use of computers, the first of information technologies (IT), in the field of health go back to the 1960s. The changes that computers would cause in medicine in that period were at the first line of the discussions. Depending on the use of the computer in the medical field, there are important thoughts such as the rate of errors in health services will be lower, that doctors will have faster access to patient information and that the right decision can be made with the use of computers (Ambinder, 2005; Kraus et al., 2018).

With the limited number of hospitals' patient fees and the use of medical fields, IT has improved with each passing year and reached its current structure (Kelly et al., 2014; Valcik, 2019). However, it was not limited to this and attracted attention from many countries of the world from the Middle East to Africa (Shorbaji et al., 2018).

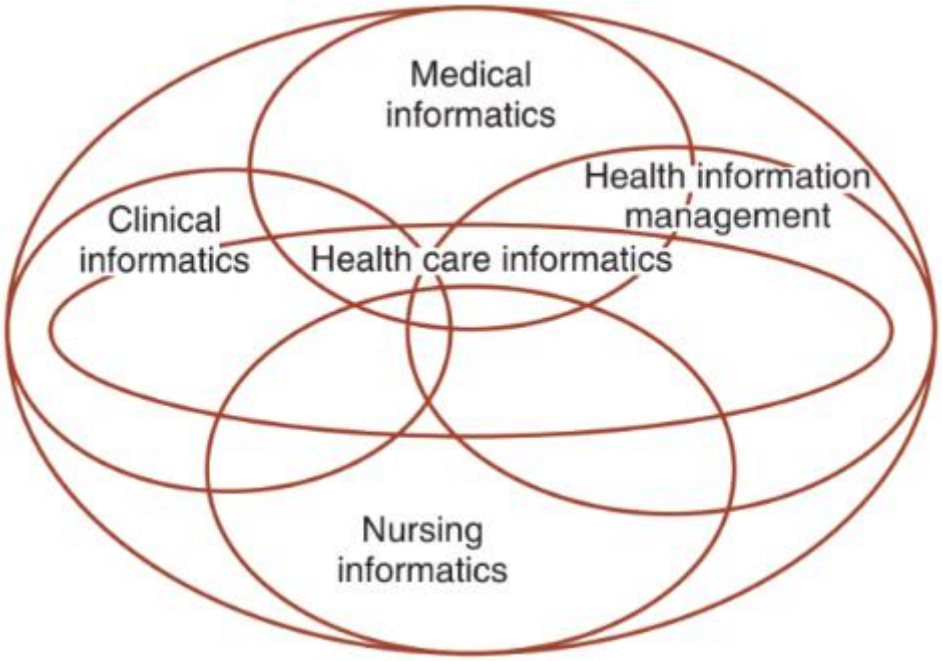

Figure 1: Venn Diagram Model

(Nelson and Staggers, 2018)

Since the first years of the use of IT in the field of health, it has been qualified to cover all components of the sector. In line with different disciplines in the field of health, IT has taken its place in the sector with the structure that takes into account all structures. As can be seen in Figure 1, medical, clinical, nursing and health management systems are in the structure including many discipline informatics in the field of health (Nelson & Staggers, 2018).

Table 1: Terms and Applications Used in Health Information System

Information Systems	Applications	Frequently Used Terms
Phone	Landline	Telephone sharing priority, Telecare, Tele-imaging, Telemedicine, Health portals, Mobile health, smart phones
Internet	Computer based	
Satellite TV	TV-Based	
Mobile Technologies	Mobile Devices	

(Mendi & Mendi, 2012)

The development of technology has affected many areas and organizations. As can be seen in the table above, the health sector is among the sectors affected by many concepts. With IT's entry into the field of health, healthcare and management has changed. This development, which can be referred to as Health Information Systems (HIS), has affected the sub-units of health and brought health management and public health services to the optimum level. HIS can be named as all of the software, hardware, methods and instructions created for preventive and curative healthcare management, presentation to organizations and healthcare services, the production and transmission of necessary information and effective use (Valdez et al., 2019; Zhao et al., 2019).

Health informatics, which brings many innovations in the field of medicine, is an important factor that transforms the existing data into information and information in the delivery and application of health services. IT is one of the essential elements in the health sector. So much so, it is among the institutions that health societies apply with its complex structure. With this aspect, systems that increase the impact of the available information and increase their efficiency to a higher level are required in the field of health. IT has an important place in health institutions with the following objectives;

- Bringing the costs to a minimum level,
- Making the most appropriate decisions by preventing the wrong decisions,
- Accessing information accurately and quickly,
- Increasing overall efficiency,
- Fast communication with the patient,
- Integration of health developments to health institutions

(Turban et al., 2008; Amro et al., 2018). For these objectives, health informatics is applied in different structures, namely, diagnosis, treatment and clinic in health institutions (Demokaan, 2017).

2.1.1. Diagnostic and Treatment Systems

In terms of health, it is understood that individuals from the ancient civilizations from Babylon to Ancient China, from Ancient Egypt to India are not affected negatively from various health problems in the society. Today, with the use of IT in the field of

health, an important step has been taken in the process of identifying, treating and following up the diseases for individuals. Diagnosis and treatment systems provide early detection of diseases and less invasive intervention, while minimizing hospitalization periods and patient rehabilitation processes (Weatherall et al., 2006; Balgrosky, 2015; Mendi, 2016). Use of IT diagnosis and treatment systems in the field of diagnosis and treatment; HIS is used in many fields such as radiotherapy system, medical archive-image and communication system, laboratory and nuclear medicine (Mendi & Mendi, 2012).

2.1.2. Clinical Information Systems

While digital transformation in IT has brought about many innovations, clinical information systems have become one of these innovations. When it comes to health and clinical information, where many people have different data, these concerns can be minimized with various measures, although it may bring inevitable concerns about users' data security, privacy and protection (Lopes, Guarda & Oliveira, 2019; Ulriksen, 2019). Healthcare delivery has been constantly affected by technological developments. With the realization of the first applications, it has been understood that even minor deficiencies in clinical systems have the potential to affect a large number of patients over a period of time (Dobson, 2016). For this reason, the use of clinical systems was given importance and divided into different sub-segments according to their types.

2.1.2.1. Patient Records and Electronic Health

The importance given to health records increased considerably in the second half of the 20th century. With the inclusion of IT in health, the efficiency of health services has increased (Ambinder, 2005; Kraus et al., 2018). Inclusion of patient records and electronic health features in the health sector has been shown as one of the most promising components of health information technologies (Williams et al., 2016). In other words, with the integration of IT in the field of health, people's expectations from health have increased and have led to higher accuracy-transparency expectations (Sneed, 2009). Electronic patient records enable the recording of many data such as the entry, referral and discharge procedures of patients, determining the current information required and the number of patients, and following the current situation in the patient (Saul, 2001). These data, which are obtained with electronic

health and patient records, bring together patients for health problems in health services, storage and use when necessary (Valentina, 2010).

Although patient records and electronic healthcare provide convenience in the field of medicine, it is also important to protect the information stored within IT against theft and manipulation in terms of security. So much so that the information stored belongs to patients, but it plays an important role in the functioning of the health system. Realization of correct and fast treatment processes is possible with healthy information of patients. For this reason, considering the use of IT in all areas of health, the development of security strategies has become inevitable. Therefore, it is aimed to protect the records of patients and electronic health systems by taking security measures for IT systems (Cengiz, 2017; Yüksel, 2017).

2.1.2.2. Clinical Decision Support Systems

One of the concepts among IT technologies is decision support systems. While the general aim is to support the administrations, the main goal is to improve the efficiency of decision making (Cil, 2002). Decision support systems are of great importance in cases where it is not possible to determine which direction to decide in unstructured or semi-structured situations. Decision support systems provide data, information and model management tools to decision makers in such cases. In addition, decision support systems are interactive (Alter, 1999). In addition, decision support systems allow decision makers to test different solutions and review data during the solution of the problem (Davis and Olson, 1985). While decision makers with decision support systems formulate the solution alternatives of all problems and send them to the computer, the computer evaluates these alternative solutions by comparing them and sends them to the decision makers again. At the last stage, the decision maker can choose between two options. These preferences, for suggestions evaluated by the system, are:

- choosing the alternative method that gives the most appropriate result
- New alternatives are taken into consideration and presented to the computer evaluation process again (Ulgen, 1980; Borab et al., 2017).

Clinical decision support systems (CDSS) in health institutions are computer package programs that contribute to the clinical decisions that health system users (doctors and other health personnel) will make. Risk levels and health conditions for patients are evaluated with the algorithms in CDSS and conveyed to system users. Medical information or clinical data are used in the use of these systems. Nowadays, doctors have to decide the management of these systems due to many changes and increases in the amount of medical information in the absence of specialists about health data. In the selection of the most appropriate alternatives for making these decisions, doctors use CDSS that have reasoning features for clinical issues (Lau and Haut, 2017; Borab et al., 2017; Berner amd Lande, 2007; Ozata & Aslan, 2004).

In a study involving 20,563 patients admitted to the hospital in order to determine the effect of the CDSS in the health system, a total of 28394 warnings were generated for the treatment processes via CDSS. In the study, it was determined that CDSS affects hospital practices marginally. In addition, although CDSS does not directly affect patient outcomes, it is among the other findings of the study that it positively contributes to the treatment and management process (Moja et al., 2019).

2.1.2.3. Clinical Information Systems

Clinical information systems (CIS) play an indirect or direct role in personal care for people to benefit from health services. With CIS, it is ensured that patients benefit from health services at the optimum level. The data entered in the system in the previous stages (patient registration, etc.) are systems that allow systematic and organized data collection and storage in CIS, and reuse them when necessary. CIS, which supports the diagnosis and treatment services effectively in health services, supports the decisions made by doctors with the arguments of guidance, thus plays a leading role in increasing the accuracy and reliability of the decisions taken, and in the recovery process in patients (Hannah & Ball, 2007).

The main purpose of CIS is to provide accurate, fast and complete information about patients in the time and location required by healthcare professionals working in the provision of health services. Doctors and other healthcare professionals (nurses, anesthesiologists, etc.) use the diagnosis, treatment and discharge processes more effectively and systematically with CIS. CIS can be used in different departments

such as editing the recorded data in the health system, reporting the results, computer aided medical devices and CDSS (Varghese et al. 2016; Wright et al. 2009; Kushniruk and Patel, 2004).

2.1.2.4. Nurse Information Systems

Another use of IT in health institutions is realized with nurse information systems. Patient information about health services plays a decisive role for nurses and their health activities. With the nurse information system, the fastest and most accurate measurement and evaluation of the process for healthcare takes place automatically. All activities for patient care, follow-up and evaluation of the treatment process are carried out through patient information systems. With this system, many functions such as determination and planning stages of treatment processes, preparation and implementation, distribution of personnel duties and time cost reduction are performed. These systems in the clinical field; plays an important role in clinical follow-up, patient evaluation, care plans, nursing diagnostics, organizing administrative activities (work schedule, budget planning, supervision, training etc.) and implementation (Mendi, 2016; Purkuoglu et al. 2019).

Nursing information systems also speed up the documentation preparation processes for health services, reduce their time expenditures for them, make them convenient and ready for use by multiple users in the data recorded in the system, and provide quality standards of patient care services (Mutluay & Ozdemir, 2014).

2.1.2.5. Hospital Information Systems

Health institutions are institutions that individuals apply for in order to benefit from health services. With the increase of the human population around the world, the search for health institutions to make the activities for the health services of individuals faster and systematic has started. As a result of these searches, hospital information systems (HIS) emerged. HIS plays a role in performing care-patient functions such as financial and legal affairs, patient management in health institutions. HIS works in coordination with other IT-enabled systems and provides support to the activities of health institutions. These systems also play an important role in the delivery of health services to the community in a more developed way. Designed in a modular way in order to work synchronously with other systems in the

health sector, HIS also provides activities such as accessing medical data of patients, communication, prescribing and transferring them to pharmacy systems (Sebetci, 2018; Atasever, Karaca, and Ucar, 2017). HIS can be carried out with electronic devices such as mobile phones, notebooks and computers, and automatically exchanges information in electronic environment, and performs the tasks of recording information on medical, financial and financial services and converting them into information (Eris and Iliman, 2019).

2.1.2.6. Patient Tracking Systems

From the moment patients apply to health services, many information is recorded in the systems. The information recorded is detailed after the check-in and entry of healthcare professionals (physician, nurse etc.). The information in the system is very important for patient tracking. Patient tracking systems are differentiated from other health services in terms of patient care and treatment procedures and are planned in a specific type of settlement. The departments with these systems are equipped with medical devices with high level of technological competence and specially trained health personnel (Mendi & Mendi, 2012; Ross et al., 2015). Intensive care units have these systems. Health parameters should be tracked as much as the diagnosis and treatment of the patient. With these systems, many vital parameters such as respiratory and blood pressure information, heart rate and oxygen saturation of patients are controlled and monitored through screens connected to IT (Hanoon, 2015; Ross et al., 2015).

2.1.2.7. Radiology Information Systems

With the development of IT in the second half of the 20th century, radiology information systems were also used in the health system. First of all, radiology information systems, in which the reports are coded and used, aimed to increase the efficiency of the physician and department. It has a feature that improves the process management of health institutions, reduces the consumption of consumables (paper, etc.) and strengthens the communication between the units. In addition to the early diagnosis and treatment of patients, it also reduces the duration of their stay in the health institution. In this respect, it benefits both segments in terms of the patient burden of the health system and the time spent in the health institutions of the patients (Aldosari et al., 2018; Nance et al., 2013).

Individuals who apply to the health institution are primarily examined by the doctor. After the examination, radiology requests are reported through the system upon the doctor's need. The radiology requests that the doctor enters into the system reach the radiology unit systems in the health institution. Considering the time taken from the examination to the radiology unit within the medical institution of the patient, the data reaches between the systems before this time. After the radiology requests requested for the patient are completed in the radiology unit, they are recorded and stored in the radiology information system integrated into the hospital information system. In addition to this registration process, the doctor who makes the radiology requests of the patient also receives records at the same time (Samei et al., 2004; Badano, 2004; Lahiri & Seidmann, 2009).

Radiology information systems work in coordination with all units within health institutions, as in other systems. In addition, radiological images recorded by the radiology unit can be given to the patient in a CD environment with DICOM format if the patient is to receive services from different health institutions. The patient can apply to the relevant doctors in different health institutions with this CD. In addition, the data recorded by the radiology unit in the system can be delivered through online databases to health institutions with the PACS (Picture Archiving and Communication System) system that enables storage, distribution and representation and interpretation (Aldosari et al., 2018; Samei et al., 2004).

When the characteristics of the radiology information system are taken into consideration, patients lose their time again, exposure to X-rays in the radiology unit, and health professionals' time and performance losses are minimized. These systems, which can be used in a limited number of health institutions compared to the new periods of technology, are used near all health institutions (especially in the last 10 years) and are offered to public-private health institutions via the national network (Liu and Huang, 2020; Nance et u., 2013).

2.1.2.8. Other Systems

IT-based systems are used in many areas of health care. One of these systems is clinical communication systems. Clinical communication systems are involved on

behalf of the health care institution with sufficient quality and confidence characteristics in better communication with clinicians. The main factor in the admission of acute care in the health institutions of individuals during the disease process is to intervene and follow negative exposures to clinical conditions. Given that human health is paramount, it is clear that being inefficient in health services may have significantly negative effects. (Wu et al, 2012). Health professionals who work in the care of health care provide communication with each other through phones. However, this communication cannot be made in case of emergency. On this negativity, health professionals are unable to communicate with each other, but health care has also been negatively affected. (Gukes and Ozata, 2005).

Clinical communication systems are integrated into health care services in line with all these problems. In today's technologies, communication and synchronization of health professionals has been achieved with widespread of tablets, smartphones and other devices. For example, blood retrieval and tests are carried out by the blood tests requested by the doctor who examined the patient at the first stage, with the arrival of blood retrieval and laboratory units through IT systems. The requesting doctor can share various information through clinical communication systems, such as how laboratory and blood retaking units should be approached and what to look out for (Joshua and Joan, 2008; Nguyen, 2015).

The health care delivery in the field of health, together with IT systems, has significantly affected the health service processes of the patients. One of these systems is telemedicine. Along with the increasing age averages of the societies, the rate of elderly population increases and their mobility as well as their transportation to health institutions are negatively affected. Considering many unfavorableness such as rural and long-distance lives to health institutions, elderliness, disabilities, physical disability, transportation problems and chronic illnesses, the rights of individuals to benefit from health services are among basic rights. Thanks to the telemedicine that has emerged in order to provide this right, the diagnosis and treatment of individuals can be carried out quickly and practically despite all the negativities (Korkmaz & Hosman, 2018; Ambrosino & Fracchia, 2017). Telemedicine and healthcare services are diagnostic and treatment services that can be provided interactively via IT systems regardless of distance (Ambrosino & Fracchia, 2017).

The health system has integrated technological developments into its structure in different years. J. Thompson and B. Fetter, working at Yale University, developed the Casemix system in 1976 regarding technological developments. This system, which is a patient classification system that separates patients with clinical features into a common structure, has a feature that connects all parameters of errors between financial and clinical concepts of health services (Zafirah, 2018; Fetter, 1999). With this system, which performs financial and clinical classification, classification and registration-verification of health services are made, as well as reimbursement of health professionals (Gules & Ozata, 2005).

Virtual and augmented reality has brought many innovations that have influenced many sectors in the field of technology. Three-dimensional IT, which feels like it is in a virtual universe, is expressed as virtual reality. Equipment such as tablet, smartphone and virtual reality glasses are used in virtual reality. With this technology, besides a different virtual reality representation (image and sound), virtual objects can be moved (Boydak, 2019). The application of virtual reality technologies in health institutions has enabled health services to be carried out in a much more professional way. Many positive developments such as developing clinical skills in operating rooms, improving their activities with intensive care and activities in all units, continuing medical education even in different places, reducing treatment error rates and direct learning are among the contributions of virtual reality (Labovitz & Hubbard, 2020; Wozniak et al., 2020).

Augmented reality is the visuality of the real world and its contents, produced by computer; including graphics, images, sound and GPS data. Augmented reality is an alive or indirect physical appearance; and it ensures that reality is increased and changed by computers (Boydak, 2019). With augmented reality, real-time entities interacting with computers, realizing interventions and other interactions are provided. The difference of Augmented Reality from Virtual Reality is that it prevents the user from breaking with reality and enriches the existing reality. Augmented reality is used today in surgical interventions, therapeutic examinations and training of health professionals (Youngjun, Hannah & Yong, 2017; Peng, 2019).

Health transactions (registration, examination, analysis, etc.) related to individuals applying to health institutions for various health problems were recorded and stored in paper-based form, which were difficult to follow and access in previous years. All these problems have been resolved with smart card applications with the developments in the IT field and integration with the health system, and applications with economic and practical use have taken place (Barkhordari & Shahriar, 2016). Smart card applications provide access to all the information (registration, examination, analysis, medication used, etc.) of the patients within the scope of health services from different locations, as opposed to accessing only through the computer. In other words, applications developed for the purpose of accessing the medical records of individuals in different places than the health institutions or geographical locations where the individuals receive service are called smart card applications. These applications are storage devices that hold the medical records of individuals through secure servers (Liu et al., 2006; Borad et al., 2017).

The development of IT has affected all sectors and has provided several advantages. However, IT has many positive as well as negative aspects. In order to prevent these negativities and to control the IT systems, management has become mandatory. In this direction, management information systems aimed to regulate the activities of organizations in order to prevent-minimize problems that may arise and to provide savings in terms of material and time. Information management in interactive environment is provided by these systems. Information management systems are necessary for the measurement of institutional performances in health institutions, clinical management, patient care, financing and the unobstructed operation of research. These systems, which are called hospital management and information systems in health institutions, play a role in providing quality health services to the society. The success of this system can be achieved by including the complex working system it has and the parts that compose them (Yilmaz & Demirkan, 2012; Wang & Sun, 2016).

CHAPTER 3

3. TECHNOLOGY ACCEPTANCE THEORIES

With the rapid advancement of technology today, mobile phones and the internet taking place in daily life, organizations' access to consumers has affected communication and information transfer, and updating has become inevitable. The use of IT in work environments has been the focus of many research and applications. In other words, understanding the reasons of which IT-related system can be adopted by which organization is among the priority research topics (Venkatesh & Davis, 2000).

Searches have begun for organizations to adopt developing technologies and adapt to the existing structure. These searches led to the emergence of many theories for the compatibility and integration of technology. In addition to addressing social problems, theorists have also addressed technology development and diffusion. Theories put forward after research by theorists have influenced society's approach to IT products and services and their preferences (Cho, Hwang, & Lee, 2012).

Table 2: Technology Acceptance Models and Theorists

Theory	Responsible Theorists
Diffusion of Innovations (DOI)	Rogers (1962)
Theory of Reasoned Action (TRA)	Fishbein and Ajzen (1975)
Theory of Planned Behavior (TPB)	Ajzen (1988)
Technology Acceptance Models (levels 1-2 and 3)	Davis (1985), Venkatesh and Davis (2000), Venkatesh and Bala (2008)

(Cibaroglu and Turan, 2018)

Some of these theories put forward by various theorists are mentioned in the table above (Cibaroğlu & Turan, 2018).

3.1. Diffusion of Innovations (DOI)

Diffusion of Innovations (DOI) is one of the oldest theories among social science theories. DOI is one of the approaches that emerged in the 1960s when technology developed. The theory put forward by Rogers in 1962 was updated by Rogers in 1995 in line with the developing technologies and the needs of institutions. The propagation rate of innovation depends on the relative speed that individuals adopt by the social system based on innovation (Rogers, 2003). The innovation, spread and evaluation functions developed in the social system are either accepted or rejected (Kır, 2018; Choi, Kim & Lee, 2010).

In the theory of diffusion of innovation, individuals play an important role in order for innovation to take place in institutions. In other words, the spread of innovation can be mentioned in the event that individuals' decision-making process for innovation proceeds positively. The flow chart for this process is as follows (Leif, 2016).

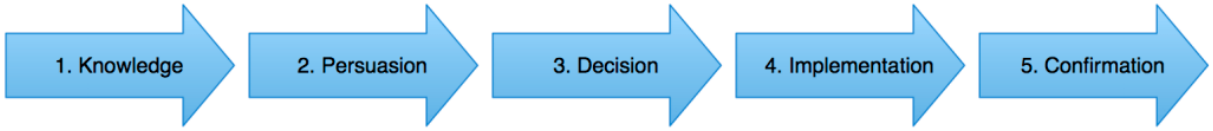

Figure 2: Rogers Individual Decision Process (İnovation)
(*Rogers, 2003*)

In the diffusion of innovations, the decision process in individuals takes place in five stages as seen in the figure above. These phases are explained as follows;

- **Information:** is the first step of the process. Individuals become aware of the innovation they encounter and begin to understand that the system is working.
- **Persuasion:** After the information phase, the individual reaches the persuasion phase. In the persuasion phase, individuals develop an attitude towards an innovation. Persons who fail to realize the information stage may not be able to succeed successfully.
- **Decision:** A person who is aware of an innovation and creates an attitude towards it will decide at some point whether or not innovation will be adopted. This stage can usually be expressed as the trial phase by the individual or his/her environment.

- **Application** With the positive result of the decision phase, individuals start to use innovation at the application stage. At the application stage, individuals continue to learn and overcome problems by minimizing uncertainty about innovation.
- **Approval:** After the implementation of innovation, individuals continue to gather information that strengthens their decision. If this situation causes contradiction in the information, the process can be reversed (Leif, 2016; Rogers, 2003).

Innovations occurring in technology or other fields can be accepted by individuals or rejected. The concept of encouraging innovation to this situation is considered to be effective. The needs of the society should be known in order to encourage and implement any innovation that emerges. According to DOI, individuals' adoption of innovation is seen in different types and proportions that will accept innovation and are expressed accordingly (Figure 3) (Rogers, 2003; Bumc, 2017).

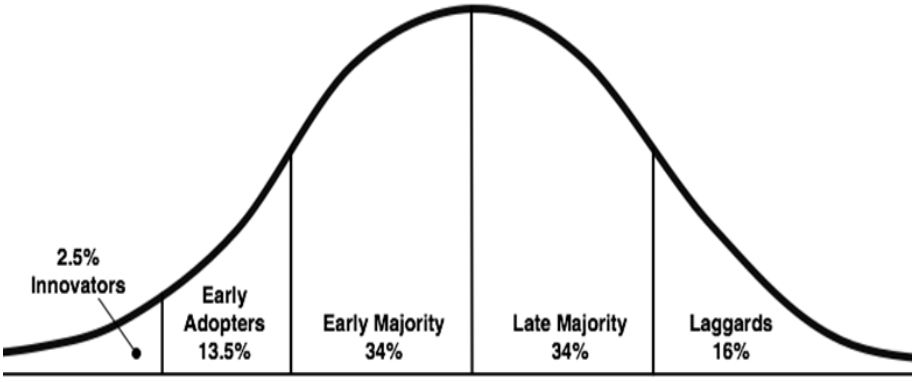

Figure 3: Individual distributions in the acceptance of DOI

As can be seen in the figure above, the approaches adopted in accepting and promoting an innovation are examined in five different categories. Those categories are:

- Innovators (2.5%): emerging-discovered innovation is implemented first by innovators. In other words, innovators are the first implementers of the new applications discovered. These people can show entrepreneurial features, they also give importance to new ideas and often develop new ideas.

Innovators are capable of taking risks in many conditions and often developing new ideas.

- Early Adopters (13.5%): These individuals possess the early adoption characteristics of opinion leaders. In addition, due to the development of leading qualifications, they can turn the exchange into opportunities.
- Early Majority (34%): These low-probability (rarely) leaders adopt new ideas earlier than normal individuals. However, before the innovation is accepted directly and quickly, it is necessary to examine the evidence for the benefit and accuracy of the innovation. While the early majority has examined these evidences, it also has skills such as addressing the society, achieving success and the efficiency of innovations.
- Late Majority (34%): While individuals in the previous category pay attention to innovation, evidence and initiatives for change, the late majority is skeptical of innovation. Although individuals in the late majority category are skeptical, they tend towards innovation if others practice innovation and experience no problems.
- Laggards (16%): Innovations can affect societies. Societies question innovations and can avoid these innovations without any detailed research. Laggard is a general statement that can be given to such individuals. These individuals, acting in accordance with their traditions, are much more conservative than other people. These individuals, who are skeptical of any change, represent the most impossible segment of innovation (Bumc, 2017).

3.2. Theory of Reasoned Action (TRA)

The development of technology-oriented development has triggered the emergence of new theories with each passing year. The DOI developed by Rogers in 1962 on the adoption of technology was followed by the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen in the 1975s. TRA suggests that social behavior in humans varies depending on individual attitudes and affects the use of new technology. In other words, it is advocated that preferences for the use of innovations introduced technologically in TRA are behaviorally affected in individuals. In addition, TRA is the basis of planned behavioral theory and technology acceptance models (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2011).

TRA, also known as Logical Theory of Action, bases behavior in individuals with intent and intention with behavior and norms. In a more concrete statement, it states that the behaviors put forward by individuals arise mainly as a result of intent, whereas TRA is based on subjective norms and attitudes towards behavior (figure 4). In this theory, it is thought that attitudes about behavior in humans will be shaped by the social-cultural beliefs of the individual in social psychology. Norms are also shaped by compliance motivation and beliefs. Positive and negative attitudes in individuals also determine whether the behavior displayed is positive (Fishbein & Ajzen, 1975; Davis, Bagozzi and Warshaw, 1989).

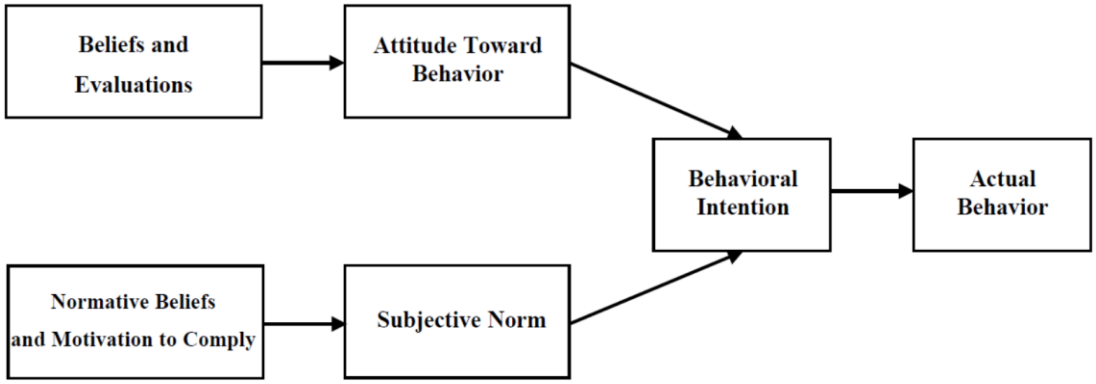

Figure 4: Theory of Reasoned Action
(Davis, Bagozzi and Warshaw, 1989)

TRA tends to understand behavior as well as predictions about individuals' behavior. TRA is a social psychology-based model. For this reason, the sub-factors that determine the intention that determines the behavior in individuals are examined. According to TRA, intention in humans is based on two different concepts. These are subjective norms created by the attitude and social influence of human nature. Attitude towards behavior is a positive or negative attitude towards the realization of human behavior. If there is a more tangible expression that any person has the idea that certain behavior will achieve a positive result in the realization of the attitude towards this behavior will be positive. The subjective norm is about the thoughts of getting positive or negative reactions from the environment when the individual performs the behavior. The environment expressed in the subjective norm is the

individual's family, friends, managers and business community (Ajzen and Fishbein, 1980; Davis, Bagozzi and Warshaw, 1989; Fishbein and Ajzen, 2011).
According to TRA, which cares about social psychology, individuals reveal any behavior and are determined by the behavioral intention stake in the stage of the execution of the behavior. Behavioral intent is defined in common with behavior and attitudes towards individuals and individual norms concerning these behaviors. Positive or negative emotions about the realization of target behavior are expressed with the intention of behavior. Individual norms correspond to the perception that the person thinking that most people who matter to the person should or should not perform the behavior in question (Ajzen and Fishbein, 1980; Davis, Bagozzi and Warshaw, 1989).

3.3. Theory of Planned Behavior

Individuals can carry different thoughts in the decision-making phase on any issue. Depending on whether technological advances are used, TPB is the theory that behaviors towards individuals are most understandable and explained using fewer variables (Lim and Dubinsky, 2005). Developed in 1988 in accordance with Ajzen's work, TPB is among the social psychological-based theories.

There are various theories in people who make statements about behavior and intention. TPB, one of these theories, is the theory that individuals with technology are empirically tested for behavior, as in the technology acceptance model. TPB, developed based on TRA basis, aims to determine the behavior of individuals towards technology when technological, social and psychological factors are taken into account. So much so that both TPB and TRA can predict the behavior of individuals in many areas between social psychology-based approaches with a high accuracy rate (Chang, 1998; Turan, 2011). How individuals make purchasing decisions for technology can be made with TPB. TPB is stated that individuals' decisions in these processes take place in line with a specific plan, even if they are positive or negative (Ajzen, 2005)

TPB can be expressed as a value-expectation approach caused by the complex decision-making process. According to Ajzen's TPB theory, factors that may affect cognitive-emotional processes associated with these decisions:

- Attitude towards the behavior: attitude towards behavior related to positive and negative assessments of behavior determined by behavioral beliefs and the consequences of taking action;
- Subjective norm: behavior determined by people around a person (friends, parents, colleagues, etc.) or normative beliefs about whether a person approves a specific behavior or the person's willingness to comply with other important people's valuations,
- Perceived behavioral control: the degree of difficulty and convenience detected by individuals for taking action or activities

(Guerin and Toland, 2020; Wasim et al.,2020) This interaction is seen in Figure 5 below.

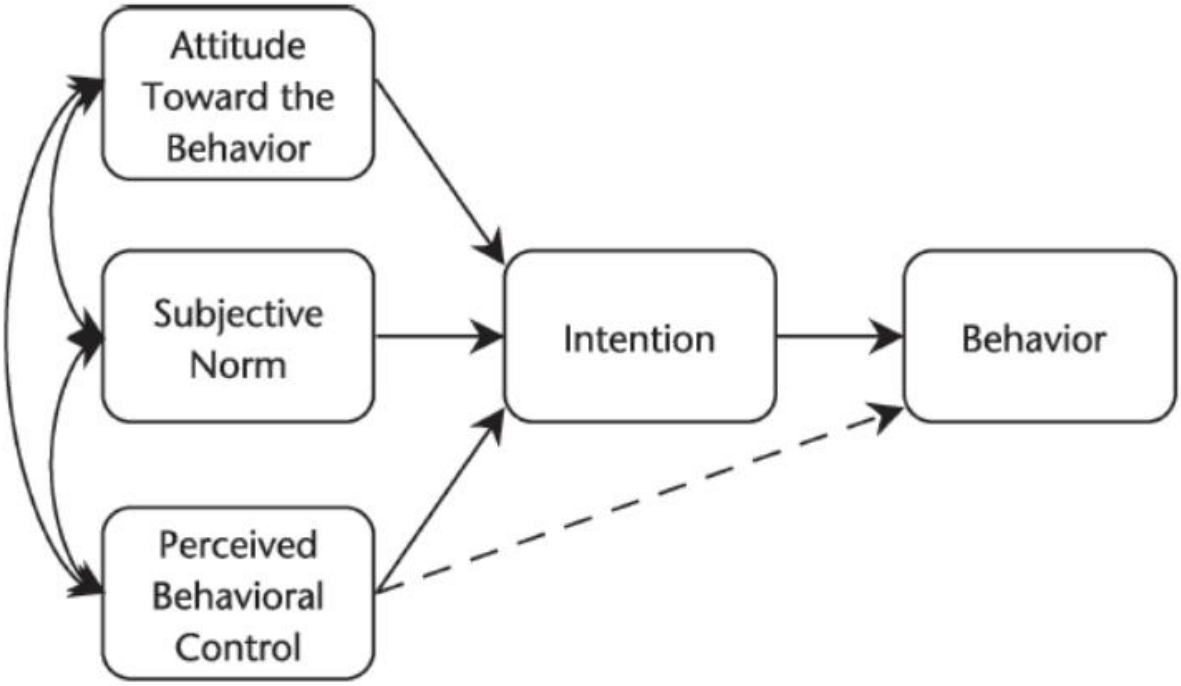

Figure 5: TPB schema

(Ajzen, 2005)

The main factor in TPB is that the individual behaves in any way. As shown in Figure 5 above, behavior in individuals occurs after intent. Perceived behavior control is determined in accordance with subjective norm and behavior. In this theory, behavioral intent is the most important determinant of behavior. They are subjective norms with attitudes towards performing behaviors that directly affect people's behavioral intentions. Unlike previous theories, TPB also includes perceived control

of behavior, taking into account factors that have no full effect on behavior (Montano and Kasprzyk, 2015; Cunnigham and Kwon, 2003).

3.4. Technology Acceptance Models

The effects of technology on the current structure and individuals after its emergence, and the acceptance of society towards it, have been an intriguing concept in many researchers for many years (Turan and Kir, 2019). As a result of these researches, many models and theories were laid out, while the concept of technology acceptance model (TAM) was inevitable. TAM is one of the most used models for the acceptance and use of IT. TAM was inspired by TRA developed by Fishbein and Ajzen (1975) to ensure the acceptance of users for information systems. TAM strives to explain the reasons why individuals prefer certain technological developments in business activities (Davis, 1985; Venkatesh and Davis, 2000).

Developed by Fred D. Davis in 1985, TAM is the model used to determine the preference or rejection of new applications in technology. TAM tries to determine the actual use of new technology by measuring perceived ease of use and perceived benefit due to the interaction between individuals and new technology (Davis, 1985). TAM divides the technology's preference process into six types (Figure 6).

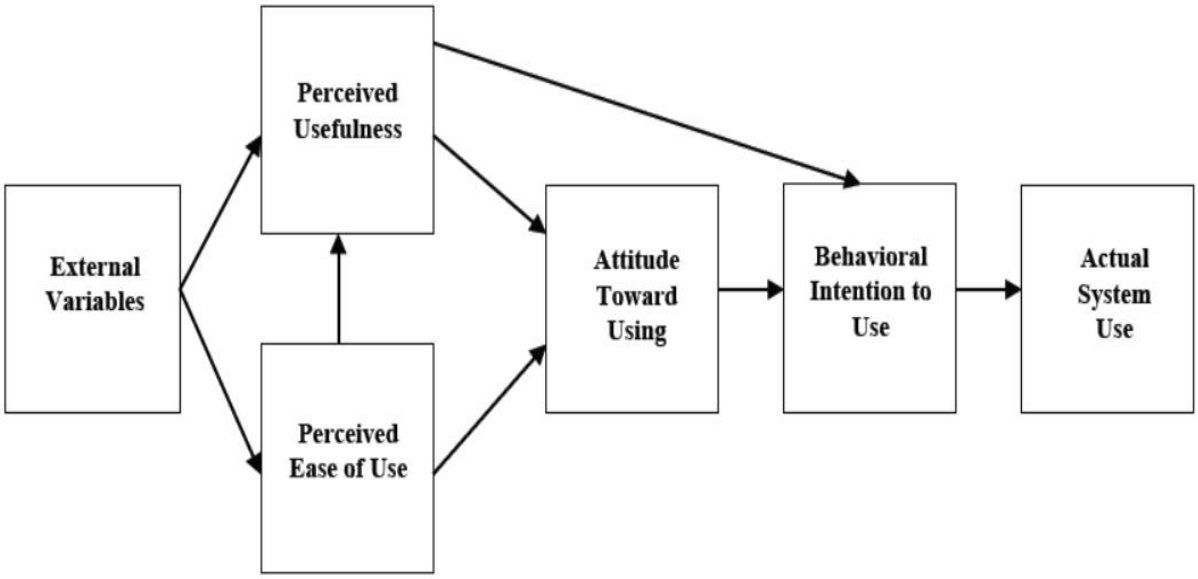

Figure 6: TAM schema

(Davis, Bagozzi & Warshaw, 1989)

In TAM, which is widely used to identify decision behavior, the determinant of the technology preference process is seen as intent (Rafique et al., 2020). Concepts that have a decisive effect on behavior in this model are perceived ease of use and perceived benefit. Perceived benefit and perceived ease of use are among the determining factors in the attitude towards use (Davis, 1985; Venkatesh and Davis, 2000). While the perceived ease of use here is the idea that the individual will not make more effort in the use of related technology than usual, the perceived benefit is the belief that there will be an increase in operating performance after the use of technology in individuals. Perceived ease of use has both usage and perceived benefit determinant. This is because the idea that the effort towards technology in individuals will not be much is occurred and the belief that the technology will provide benefit to the work performance in order to profit from labor. In a more concrete way, the factors that affect all are equal and constant, while the technology is easier to use, the attitude towards technology will be in that direction (Venkatesh & Davis, 2000; Turan & Kir, 2019; Rafique et al., 2020).

The perception of ease of use, which is seen in humans as intended for any system,

- supports the hypothesis that general technological and self-sufficiency have always been always linked
- and that objective usability affects ease of use.

The individual's perceptions of any system only occur after direct use of the system and the acquisition of experiences (Venkatesh and Davis, 2000). When TAM is examined, online and digital using technology; in many different researches, including shopping, library and education, it is seen that it is used in the reviews for technology acceptance. TAM also incorporates individuals' exposure to external factors in their decisions (Rafique et., 2020).

TAM is known to be among the theories most studied by researchers. This is because unlike many theories, it is a general model that examines the lowest possible number of variables and adoption insights against many different IT (Rong et 2005).

3.5. Model of PC Utilization MPCU (PC Utilization Model)

Individuals have started to use their computers and systems in their working environments in accordance with technological developments. MPCU theory means that although it is not mandatory in working environments, employees' computer usage preferences can vary in line with different factors. Unlike other theories, MPCU distinguishes between sensory and cognitive components in behavior in individuals.

MPCU was developed by Thompson, Higgin and Howell in 1991 to explain computer problems that arise due to technological developments. MPCU was developed based on Triandis's theory of individual behaviors in 1971 (Seuwou et al. 2016). MPCU is stated as "Behaviour is determined by what people would like to do (attitudes), what they think they should do (social norms), what they have usually done (habits), and by the expected consequences of their behaviour" (Thompson et al., 1991).

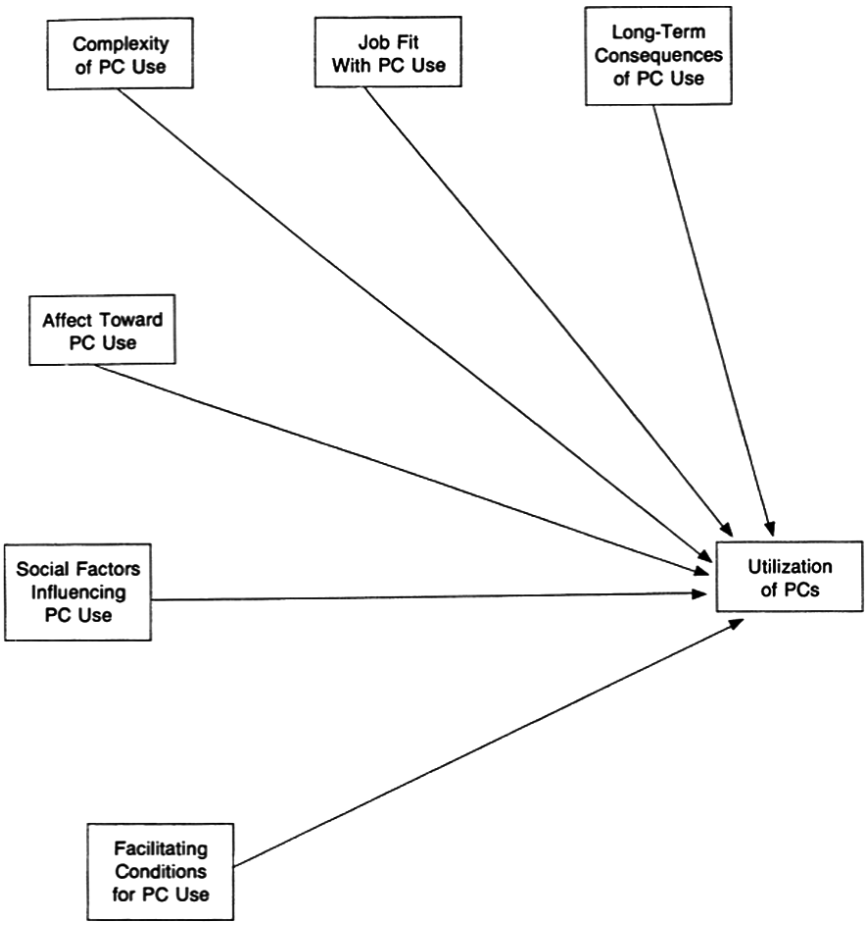

Figure 7: MPCU Schema

(Thompson vd., 1991)

The theory of individual behaviors refers to factors affecting the behavior of individuals, and that the expected results in attitudes are based on factors such as habits and social norms. Here, attitudes consist of emotional, cognitive and behavioral components. In MPCU, computer use facilitating conditions are affected by social factors, impact level and perceived results. The perceived outcome concept includes suitability, complexity and long-term results (Seuwou et al. 2016).

3.6. Unified Theory of Acceptance and Use of Technology (UTAUT)

Many models and theories for technology have been revealed in various researches. 8 different theories and their models (TAM, TRA, MPCU, et al.) have contributed to the development of the Unified Theory of Acceptance and Use of Technology (UTAUT) together with the reviews carried out by Venkatesh and his colleagues in 2003 (Venkatesh et al, 2003; Dwivedi et al. 2019). In other words, UTAUT is a theory that is put forward by integrating multiple model-theory (Lekitlane, 2015).

Managers are as involved in working environments and in the use of technology as well as employees. Managers continue their management activities for working environments, but management of technological products is also important. The UTAUT model is an improved version of TAM, which contributes to assessments aimed at improving success and allowing managers to understand effective concepts for technology success. UTAUT aims to disclose advanced behaviors and behavioral intentions to be used. UTAUT also expresses that behavioral intent and real system use are influenced by the concepts of gender, age, experience and volunteerism. In addition, this theory suggests that four main structures have significant effects on behaviors for purposes for use. The four main structures here are the expectation of effort, performance expectation, social impact and conditions that facilitate the situation (Wong et al., 2013; Marwah, 2016; Dwivedi et al., 2019).

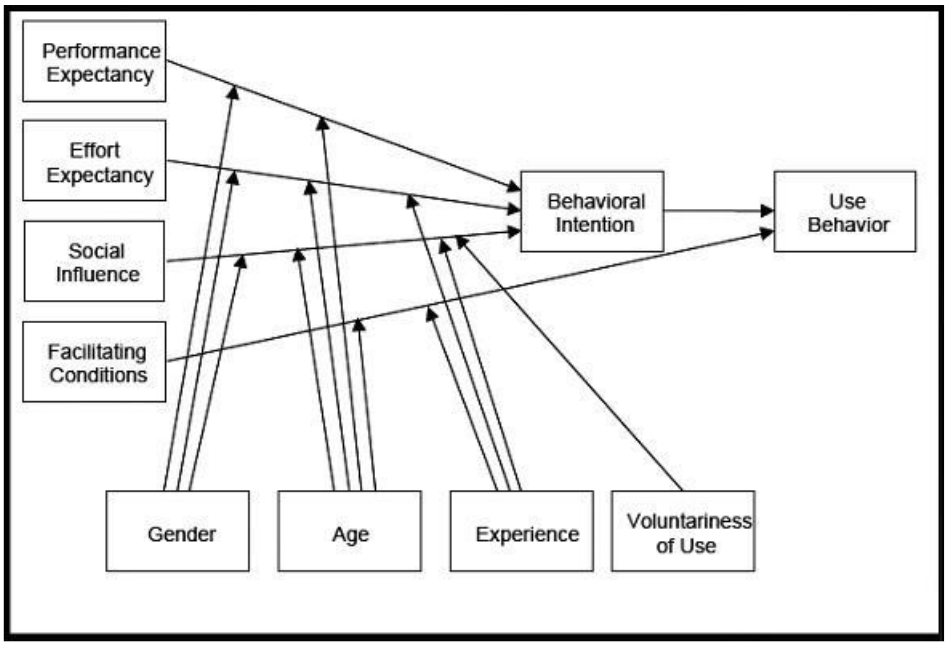

Figure 8: UTAUT Model Schema

(Lekitlane, 2015)

In UTAUT, the concept of performance expectation is expressed as the level at which individuals will contribute to better rewards for using the system. Additional reporting in UTAUT are as follows;

- The expectation of effort is the level of convenience, depending on the use of the system,
- Social impact: the idea of believing that others in individuals are required to use the new system,
- Situations that make the situation easier: the level of belief that technical and organizational infrastructure exists in order to contribute to the use of the system in individuals

In cases where behavioral intent is high, it affects performance growth following the increase in the need for real system use. In the UTAUT model, 70% of the technology usage variant is very successful in explaining the intention of behavioral use (Venkatesh et al. 2003; Venkatesh and Zhang, 2010; Wong et al., 2013).

CHAPTER 4
PUBLIC PRIVATE PARTNERSHIP AND CITY HOSPITALS

4.1. Public Public Private Partnership

4.1.1. Description and Features

Looking at the most general definition of public-private partnership, it can be said as the joint effort of both private and public sectors in the presentations by expressing the service and infrastructure problems. However, when looking at the definition, this definition was seen as somewhat incomplete, and it brought many criticisms. Because this definition is not considered up-to-date since it does not cover innovations. Accordingly, the definition was exposed to criticism arrows as it was deemed incomplete. When looking at the history, it has been seen that the private sector is not only for cooperation with the public. The private sector appears as a sector that cooperates in many branches and fields.

According to Vives, Benavides and Paris (2002), when we look at infrastructure projects, it is revealed that both the private sector and the public sector have all kinds of participation. Accordingly, both the private sector and the public have been gathered under Public-Private Partnership, since both the private sector and the public sector maintain their presence in all infrastructure projects.

Although it has been subjected to much criticism in its most general definition, many individuals or organizations have made a definition of public private partnership. We can list these definitions as follows:

> -It can be defined as long-term contracts signed between the private sector and the public for the establishment and execution of public services. Here, the main responsibility falls on the private sector. Because it takes on private sector risks and management responsibilities (World Bank, 2017).

-Agreements made with the administration by private partners. Here, the person providing financing, the person who runs the business can enter the private partners. This agreement serves a common profit by the partners and is also one of the agreements where risks are taken into account (OECD, 2008: 17).

-It emerges as the formation of infrastructure-based regulations by the private sector and developed by the private sector (IMF, 2006: 1)

4.1.2. Advantages and Disadvantages

Since public resources are limited, joint-based projects are put forward with the private sector in public projects. While PPP take part in the provision of advanced public services with a strong and high level of public service, it is seen as an advantage to offer innovations as a service to the society with private sector technology.With the inclusion of companies with international competence, PPP carried out in cooperation used as a method. In addition, PPP provides opportunities to get work from the contractor on behalf of national companies in many areas such as construction, facility management, cleaning, security, electricity, catering activities, maintenance activities.

This aspect provides many contributions to the private sector. It also positively contributes to the delivery of better public services by countries, as a way of providing services by following private sector technology and innovation. It provides continuity in the economy by simplifying the infrastructure, making the country more competitive in terms of infrastructure foundation, and supporting businesses and industries related to infrastructure development (construction, equipment, support services, etc.). Facilitates support of limited public sector transcendents to meet the increasing demand for infrastructure development and increasing (World Bank, 2017)

4.2. Public Private Partnership Examples in the World

Regarding Public-Private Partnership (PPP) projects, it is known that the countries with open use, private and public jointly realize risk sharing in order to meet the increasing infrastructure needs. At the same time, public-private cooperation is the method of providing the money and credit required for development, which is applied in relation to cooperation. There are methods such as Build-Operate-Transfer, Build-

Operate, Build-Rent-Transfer, Transfer of Operating Rights. One of the projects adopted widely as a model and slew the build-operate with Turkey as of today.

Considering the data shared by the World Bank, it is seen that in the period between 1990 and 2016, a total of 7132 projects with a budget of 2.6 trillion dollars were carried out within the scope of the Public-Private cooperation method of the developing countries. In public-private partnership projects, Latin America and the Caribbean region appear to have the highest share with 1 trillion dollars. East Asia, Pacific, Europe and Central Asia come after Latin America and the Caribbean, respectively. In the projects realized, the highest investment was made in the information-communication technologies (telecommunications) sector, with a value of over $ 1 trillion ($ 1.040 billion). Following information-communication technologies, sectors such as electricity, highway and airline take place respectively. In the electricity sector, the highest number of projects were carried out. Again, according to the World Bank data, the top 10 countries with the highest project stocks in developing countries between 1990 and 2015 are as follows (Tenşi, 2019; Ministry of Development, 2018).

Table 3: Countries and Project Costs

No	Total Investment Amount (Billion Dollars)	Country
1	517	Brazil
2	343	India
3	165	Turkey
4	155	Russia
5	145	China
6	142	Mexican
7	98	Argentina
8	73	Philippines
9	72	Indonesia
10	69	Chile

Despite these data, the most projects were carried out in China with 1,326 units. India and Brazil are located after China, respectively. Turkey, meanwhile, it is understood that ranks eighth with 185 projects. Regarding Turkey, the amount of projects in third place despite receiving project units / quantity terms is seen as inferior ranks. With this situation, it is understood that the amount of investment made

in each project is higher than in other countries. As a result, in an analysis considering data for the World Bank post, while countries where public-private cooperation projects in countries in development stages numerical sense, the more it is at most of the top five countries within the project per investment amounts to an average of Turkey, the figure is 892 million dollars. Subsequently, Brazil with 627 million dollars, Russia with 453 million dollars, India with 383 million dollars and China with 109 million dollars (Tenşi, 2019; World Bank 2017).

4.3. Public Private Partnership in Health

4.3.1. Historical Development

The Ministry of Health (MoH) preferred to use the public-private partnership method in health services both in terms of organization and economy in the new restructuring environment in the Turkish health system (Kerman et al., 2012).

Today, with the outsourcing method in hospitals, laundry, security, cleaning, medical device repair-maintenance, product-patient transfer services as well as operating room, sterilization, radiology and laboratory services are included in the outsourching method. With the changes made in the Health Services Fundamental Law (03.07.2005), new practices have come into force. Along with these applications, MoH can undertake the service delivery in healthcare facilities by private or real legal entities when necessary.

However, following the legal processes initiated by the MoH, after many lawsuits, public loss occurred, and with the measure taken in 2013, the MoH made changes in the construction process sanction, renovation and outsourching (service) purchases with the Public-Private cooperation model. With this change, ourtsourching purchases in health institutions were regulated in detail at the law level (Gürkan, 2014; Pala, 2018).

The public-private cooperation / partnership example was first set as an example in England. The PPP model, which has been implemented in England since the 1990s and then spread rapidly, has the opportunity to be applied with different sub-models in countries with various socioeconomic development levels. The main features of the

Special Finance Initiative (PFI), which is a Public-Private Partnership (PPP) model applied in the UK, can be summarized as follows (Alshawi, 2009):

- PPPs are service purchases, not goods purchases.
- The main purpose of the public sector in PPPs is to provide value for money and to benefit from the technical knowledge and experience of the private sector.
- Risk management is distinguished between public and private sectors in PPPs.
- Cooperation between public and private sectors is essential in PPP infrastructure projects throughout the life of the project.

This model, which turned into an example, in the health sector in Turkey "integrated health campus" and "city hospitals" are implemented as planned. Important studies have been initiated for the implementation of the plan.

In Turkey, the main problem with finding a solution to the health sector, effective health services, efficient, and equitable from an appropriately be organized and 2003 with the aim to provide financing "Transformation in Health Program" a number of changes and transformation plans by the name have been implemented (Ministry of Health, 2003: 25).

In addition to the objectives of the Health Transformation Program, such as gathering health insurance systems under a single roof, transferring 947 hospitals belonging to social insurance institutions to the Ministry of Health, increasing the number of units providing emergency services, a significant part of its goals is to increase the role of the private sector in the construction and operation of hospitals. by transforming them into modern facilities and increasing their administrative and financial autonomy. These programs, divided into 29 health districts and services Turkey has started to be planned accordingly. City hospitals, which started to be built with the PPP model, have become one of the most important elements of the change and transformation process carried out within the scope of the Health Transformation Program. The city hospital model has given a new impetus to the Turkish healthcare system and is described as a new reform.

4.3.2. Historical Development

The PPP example aims at financing, renovation or protection of facilities and investment in public services or infrastructure investments. In line with this purpose, the cooperation method created by the public and private sectors gains importance and the cooperation continues its activities as a cooperation between the public and private sectors in order to provide public services. To give an example to this, earnings between the private sector and the state are differentiated by the allocation of responsibility, risk and investment. The purpose of achieving such collaborations is the creation, financing, construction, operation and maintenance of public infrastructure and services. As a result, the issues that the public administration takes responsibility for in public-private cooperation projects are audited. As stated, in this example, the State cooperated with the private sector in providing the specified services. With this cooperation, the responsibility of the state to the public and the duty of supervision and control continue, regardless of the situation and circumstances (Kerman et al. 2012; Gürkan, 2014).

The fact that both the public and private sectors have their own characteristics that create different advantages for the parties in certain services and projects is the most important reason for the creation of this example (model). The private sector and the public complement each other with their unique qualities. With the strength of this structure, the economic difficulties in the provision of public services are overcome and the public good is served. However, the public also has the opportunity to benefit more from the private sector's know-how. In this context, as the world population increases over time, the need for health services especially in the world countries is increasing. In order to meet these increasing health needs, the public sector tends to act in cooperation with the private sector in the establishment or renovation of new health facilities in order to better meet the needs of the needy (Kerman et al., 2012).

Know-how, dynamism and creativity in the private sector together with insufficient financing, ie budget constraints, show that the increase in efficiency in services and investments, in other words, as a means of financing or efficiency / efficiency, the public and private sector cooperation is required. The cumbersome structure, delayed activities, social services and the society's tiring structure, which have been revealed in many studies for many years, of the public sector may be reduced-

resolved by this method. It is considered that it is indisputable in terms of public interest that the needs of the public will be realized in a way that the higher quality and useful energy as a result of this project will be in excess of the total energy spent (Karahanoğlulları, 2011).

4.3.3. City Hospital and Structural Properties in Turkey

Models involving public and private sectors in Turkey, since 2017 began service in different sizes in different provinces. This model, known as City Hospital in the field of health, the health care system in Turkey has brought an increase in the speed in little time. It has also been implemented with a different regulation. In this model, which is preferred for solving the physical and basic inadequacy of the hospital duties, which have a very important place in the presentation to the public for health services, City Hospitals start to operate in different locations each passing period (Karahanoğulları, 2011; Pala, 2018).

With this model, there is a certain construction period and the following operating period for any project determined. There are contracts covering both construction and operation period, which are legal basis that specify many issues such as material, service type and service periods-types. In other words, if this is exemplified by the existing buildings, on behalf of the city hospital built in Adana;

-The process related to project construction is 3 years,

-25 years of operation by the private sector,

considering the construction and operation periods, a total of 28 years of public-private cooperation must continue. Health institutions that have been put into practice with this understanding have the property that can be given to the MoH in the next period or the operating period can be extended in line with new conditions (Gökbulut, 2019; Pala, 2018). The project is planned for 18 cities in Turkey in hospital, 13 of them have been put into service, 5 of them are scheduled to enter service in 2021. The table for these hospitals is as follows (Ministry of Health, 2021).

Table 4: City Hospital and some properties in Turkey

No	Project Name	Bed Capacity	Targered Completion Date
1	Adana City Hospital	1550	Put İnto Service
2	Mersin City Hospital	1294	Put İnto Service
3	Isparta City Hospital	755	Put İnto Service
4	Yozgat City Hospital	475	Put İnto Service
5	Kayseri City Hospital	1607	Put İnto Service
6	Manisa City Hospital	558	Put İnto Service
7	Elazığ City Hospital	1038	Put İnto Service
8	Ankara Bilkent City Hospital	3711	Put İnto Service
9	Eskişehir City Hospital	1081	Put İnto Service
10	Bursa City Hospital	1355	Put İnto Service
11	İstanbul Başakşehir City Hospital	2682	Put İnto Service
12	Konya Karatay City Hospital	1250	Put İnto Service
13	Tekirdağ City Hospital	486	Put İnto Service
14	Kocaeli City Hospital	1210	2021
15	Kütahya City Hospital	610	2021
16	Ankara Etlik City Hospital	3624	2021
17	Gaziantep City Hospital	1875	2021
18	İzmir Bayraklı City Hospital	2060	2021

Source: Source: Ministry of Health, 2021.

4.4. Future Planning of City Hospitals

State hospitals only serve the province they are located in or are preferred. However, the goal of city hospitals is to provide services to neighboring provinces and neighboring countries when necessary, in other words, to play a role in health tourism. It is a matter of fact that the national and international health tourism plans are made in this direction. Accordingly, city hospitals are not only hospitals, but also a structure where various activities can be carried out, from restaurants, markets to

accommodation services. City hospitals established in this context are run by public and private partnerships. Public hospitals are healthcare institutions established directly with the MoH budget (Basa, 2017; Gumus, 2018; Tenşi, 2019).

In city hospitals, patients stay in single-person private or more comfortable rooms, while state hospital rooms and physical conditions are more limited. It is seen that mostly service and polyclinic rooms are cheap and small. Unlike general hospitals, on the campus of city hospitals, there are also sub-branch hospitals such as gynecology and pediatrics, physical therapy and rehabilitation, oncology, mental health, high-security forensic psychiatry. In terms of hospital employees, the number of parking lots in city hospitals is quite high compared to public hospitals. Likewise, there are many working needs and resting areas, the devices and materials used are zero in city hospitals, and there are device and material problems in existing state hospitals (Basa, 2017; Tenşi, 2019; Benli, 2020).

4.5. The Importance of City Hospitals in the COVID 19 Process

In this period when the new type of coronavirus (Covid-19) affected the whole world as a pandemic (global epidemic), the importance of health services has once again emerged. In our country, city hospitals make a great contribution from our faculty projects that maximize the quality of healthcare services with the latest technology, physical infrastructure and qualified bed capacity in the fight against corona 19 viruses. In hospitals with all necessary units and high number of intensive care beds, all cases diagnosed or suspected are treated and controlled. Many hospitals, which are together in the field, service quality, as well as qualified human resources also for our city which is the address of the prominent centers of excellence hospital despite some critical approaches, contributions to the city hospital healthcare services in Turkey has set a quota to the actual value in these difficult processes (AA, 2020).

City hospitals are among the health institutions equipped with the most up-to-date technology and facilities among today's health institutions. The technology and all facilities in these institutions are used by healthcare professionals and provide healthcare services to the community. Therefore, in city hospitals, together with IT-related technological facilities, the knowledge-experience levels of the healthcare personnel who use these facilities in the service process are important In this context,

effective and efficient sustainable service policies, in which applications such IT trainings; Multi-disciplinary multi-location teamwork, Proton therapy, 3D real-time medical imaging and "on-site" and "remote" interventional and invasive medical interventions using robots, "Home Care" Services fully integrated with the hospital, "Personalized" medicine / Nanorobots - nano medicine, Tele-medicine and mobile healthcare, Molecular medicine, Preventive medicine applications, Evidence-based medicine / Defensive medical approach should be planned.

City hospitals, which are among the healthcare structures implemented in different countries, offer different experiences to the society. As it is known, hospitals are preferred in the practical training of healthcare personnel candidates. In this context, with the technological investments made by city hospitals, it should also take a role in pre and post graduate health professions training. University affiliations should be enriched with different models. In this context, a triple management mechanism consisting of the university, hospital management and contractor should be considered.

It is known that IT systems are used in city hospitals as well as in different sectors and enterprises. It is understood that healthcare personnel take health-related courses intensively during their health education period (high school and university education period) and that they cannot be provided with theoretical-practical training regarding current technological applications, considering their education period. Therefore, regarding IT systems used in city hospitals; It is necessary to provide trainings according to the user profiles determined for all systems, hardware, all modules and interfaces of the software used end-to-end, and the needs should be determined in certain periods and the trainings should be repeated theoretically and practically within the specified conditions.

CHAPTER 5
HIMSS

The use of technology in the health sector has contributed to healthcare professionals and individuals to receive more systematic services. With each passing day, health institutions give more importance to digitalization. These institutions, which do not want to lag behind developments, invest in digital hospital applications in order to provide more professional service to individuals. While many data about patients and diseases have been archived in square meters of paper and film in previous years, this situation is stored in IT systems that occupy a few square meters today. In other words, it is inevitable for IT to become widespread in the health sector day by day and for the health sector (as in other sectors) to become dependent on IT (Sajed, 2015). Health institutions where IT is in use are defined as digital hospitals. In these hospitals, IT is used for the benefit of healthcare professionals and patients. Digital hospital applications are the systems preferred for the purpose of increasing the quality and delivery of health services, patient safety and personnel efficiency (Sligo et al., 2017; Austin et al. 2018).

The digital hospital has a lower energy and time-consuming structure within the jurisdiction of healthcare professionals (nurses, doctors, etc.), where ITs within the health institutions are fully integrated with all medical and non-medical technologies, and reliable data flow standards are set. In addition;

- Regardless of location, health-related data can be accessed independently and mobile anywhere
- Providing more practical and faster health services without the need for materials such as paper and film,
- Making the healthcare staff's business processes effective,
- Digital applications that ensure the control of the right treatment and drug applications,

- Performing all transactions with full automation systems,

can be provided with digital hospital applications. In this process, the delivery, management, control and functioning of the health system is also provided through digital hospitals and applications with the provision of efficient, effective, economic, quality and accessible service (Ak, 2010; SB, 2017; Limon, 2019).

The digitalization levels and processes of services provided to the community by health institutions should be at a sufficient level. Thus, the use of IT systems (information, decision support, etc.) used in the field of health enables the high level of the provision of health services to the society. Health institutions can have different technological levels. These levels emerge as a result of the evaluations made by the Health Information Management Systems Society (HIMSS) for the digitalization of health institutions (Wager et al. 2009).

Globally guided algorithms for IT use are developed by HIMSS for the purpose of providing safer and better service to healthcare institutions worldwide. The orientation of health institutions towards technology is increasing day by day. For example, when looking at HIMSS data around the world;

- While 54,000 individual and 250 non-profit organizations were members in 2016 (Kilic, 2016),
- As of 2020, 80,000 individual members, 470 non-profit organizations, 650 health services organizations and 480 provider organizations are members (HIMSS, 2020).

HIMSS, based in Chicago in the United States, is a global consultant with the transformation of IT in the health ecosystem. Established in 1961, HIMSS is used in more than 200 countries in many continents worldwide, including Europe, America, Asia and the Middle East. HIMSS offers unparalleled depth and breadth in health innovation, public policy, workforce development, research and analytics to advise healthcare institutions and stakeholders on individuals applying to the healthcare institution about best practices in health information and technology. HIMSS provides basic information, training and interesting activities to healthcare providers, governments and market suppliers through innovation and ensures that they have the right information at the decision point (Kilic, 2016; Sebetci et al., 2017; HIMSS,

2020). The contributions of HIMSS to health institutions and their changes by years are detailed in the graphic below.

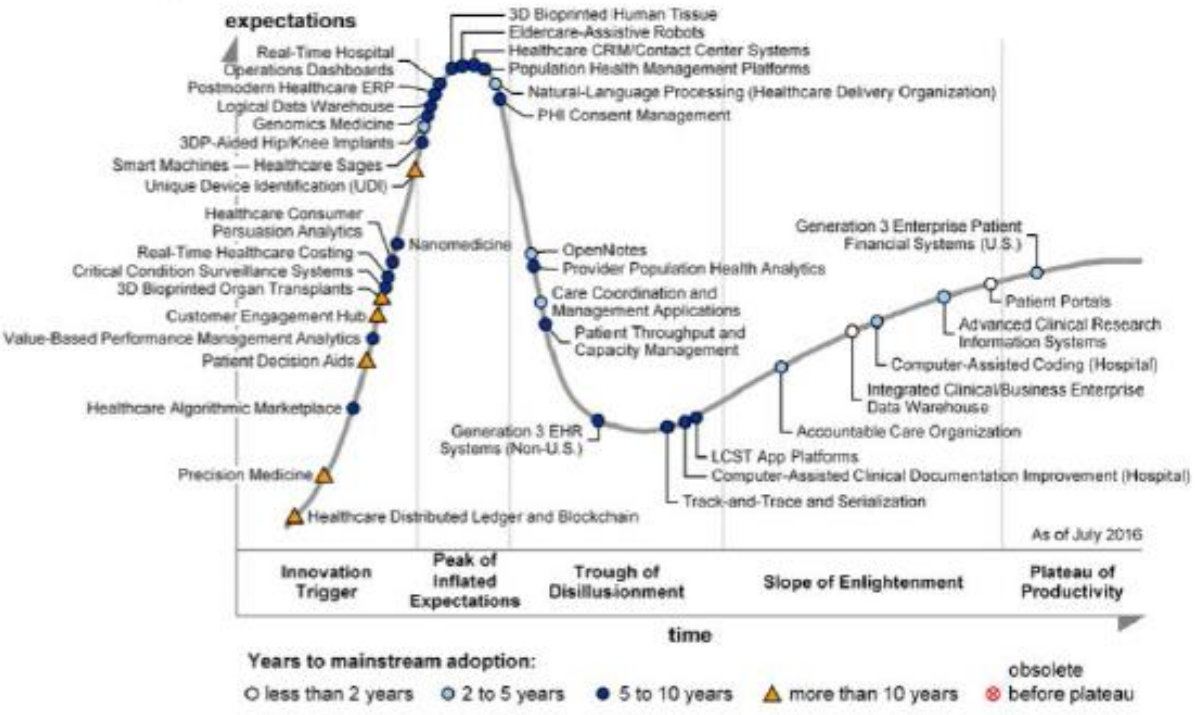

Figure 9: Hpye Cycle for Healthcare Providers

(Gartner, referred from 2016 by Köse, 2019: 3)

HIMSS, which is composed of health members aiming to use IT more efficiently and for the benefit of the health sector in the field of health, organizes events for the most current issues in health and care services worldwide, and shares information in the fields related to care and health services in the media. In market research and analysis, HIMSS can carry out activities to provide support for data analysis to many stakeholders such as health institutions, technology solution providers, and support the implementation of advanced decision-making mechanisms. HIMSS also provides support to healthcare administrators in government relations in the development of IT in patient care, determining innovations, conducting health system transformations in countries in the regional sense (education, resources, consultancy, etc.). Certification and career development of health institutions and stakeholders are also provided with HIMSS (SB, 2017; Savino and Latifi, 2019; HIMSS, 2020).

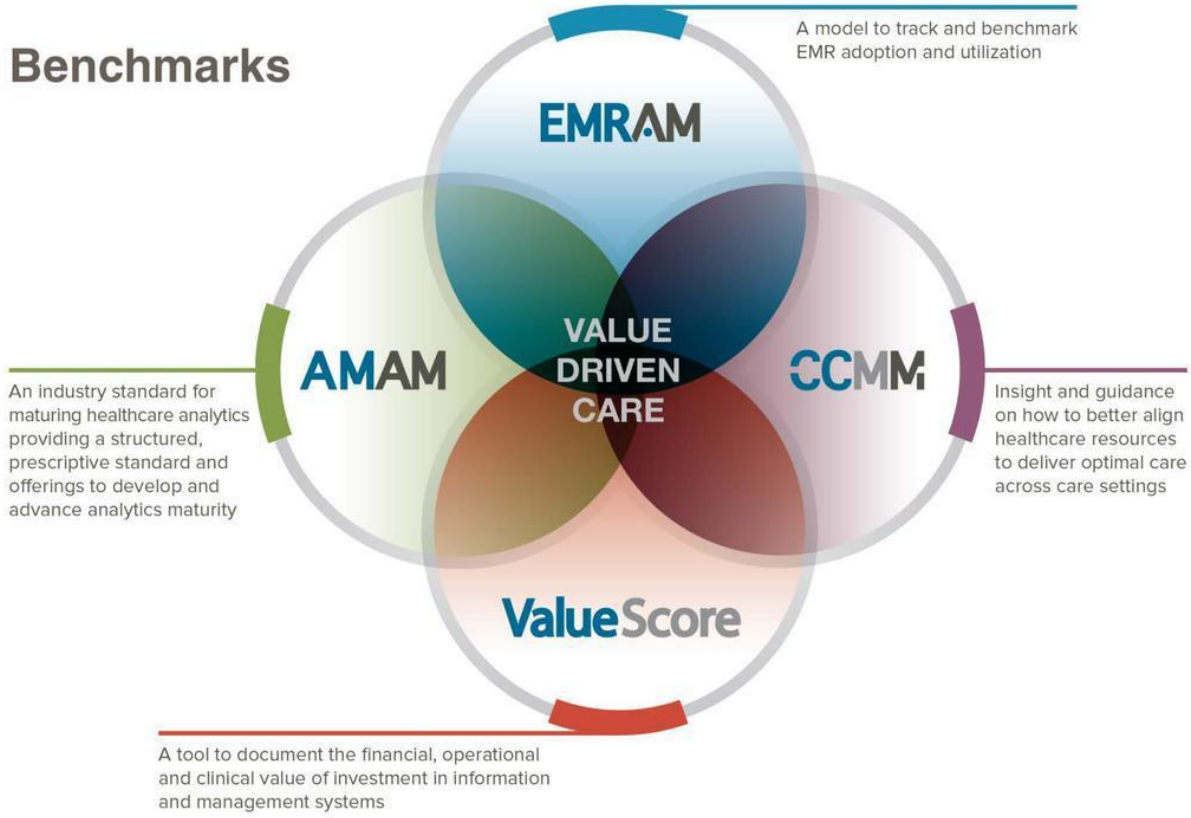

Figure 10: HIMSS Benchmarks

(Köse, referred from 2018 by Bülbül and Medeni, 2020: 102)

Rating standards of health institutions in HIMSS are stated as follows:

- Electronic Medical Record Adoption Model (EMRAM)
- Adoption Model for Analytics Maturity (AMAM)
- Continuity of Care Maturity Model (CCMM)
- Value Score
- Outpatient Electronic Medical Record Adoption Model (O-EMRAM)
- Digital Imaging Adaptation Model (DIAM)

5.1. Electronic Medical Record Adoption Model

Today, the world focuses on integrated IT based health information systems that are compatible with standards, integrated, consist of modular and components, patient-centered, internet-based, support workflow, internal and external electronic communication, digital identity determination methods, ensure the security and privacy of health information, store health care data for life, performance based

health care quality measurement, support for medical decisions and transition to e-health (Güles, 2008). HIMSS plays a facilitating role in health institutions' compliance with IT and technological functionality (Cresswell et al., 2019).

In health institutions, data for health and patients were provided with various materials such as paper prior to technology. However, with the technology and especially with the HIMSS Electronic Medical Record Adoption Model (EMRAM), it is aimed to create a paperless environment in healthcare institutions and take service management for health technologies to advanced levels. Thus, it is aimed to eliminate the use of paper in all procedures from the moment a patient enters healthcare, including services such as treatment, billing, imaging, laboratory, pharmacy, and nursing (Pettit, 2013; Avaner & Avaner, 2018).

Health institutions need to offer this service to the society at certain levels, while using digital applications. For example, while the results of a patient's related analysis (blood, urine, x-ray, etc.) are seen by the related physician via digital systems, the lack of similar data of another patient may indicate that this level is not sufficient (Pettit, 2013; Bayer et al., 2019). EMRAM addresses the electronic medical recording capabilities of healthcare institutions providing inpatient healthcare services, ranging from the most basic services to the paperless medical recording environment. With this model, HIMSS provides an accreditation certificate by making an internationally recognized rating in Europe to evaluate the digital processes of health institutions and to determine the level they have reached, and by declaring the hospitals that have reached the 6th and 7th level in international HIMSS organizations. The levels in EMRAM start from 0 to 7 (Degoulet et al., 2017; Gutierrez et al., 2017; SB, 2017; Bayer et al., 2019; Köse, 2019).

Table 5: EMRAM and Stages

Stage	EMRAM Cumulative Capabilities
0	All three ancillaries not installed
1	Ancillaries - Laboratory, Pharmacy, and Radiology/Cardiology information systems; PACS; Digital non-DICOM image management
2	CDR; Internal Interoperability: Basic Security
3	Nursing and Allied Health Documentation; eMAR; Role-Based Security
4	CPOE with CDS; Nursing and Allied Health Documentation; Basic Business Continuity
5	Physician documentation using structured templates; Intrusion/Device Protection
6	Technology Enabled Medication, Blood Products, and Human Milk Administration; Risk Reporting; Full CDS
7	Complete EMR; External HIE; Data Analytics, Governance, Disaster Recovery, Privacy and Security

(HIMSS, 2017, 2017a)

In the table above, the level 0-7 categories of health institutions are stated in EMRAM. At HIMSS, primarily paperless and digital healthcare institutions reach certain standards and increase their numbers in the international arena. In addition, HIMSS aims to provide better quality of health services. In order to achieve these goals, it offers the following solutions;

- An independent, objective analysis and perspective
- Accurate, reliable data, information and knowledge
- Skilled and experienced healthcare IT professionals, market research, analysis and strategy,
- Value-based solutions, lower cost, increase revenue and increase market performance.

HIMSS evaluates both the state and private hospitals that apply to them with their globally accepted accreditation and standard systems to evaluate their digital processes in their transformation to digital-paperless hospitals and to determine how digitalized they are (Oner, 2014; HIMSS, 2017). These categories are (HIMSS, 2017; 2017a; 2017b; SB, 2017; Nordic, 2018);

Level 0: It refers to hospitals where even the most basic medical systems (pharmacy, laboratory and radiology) and processes are not available in digital media.

Level 1: These are hospitals that all pharmacy, laboratory and radiology information systems exist together. As a complete complement of radiology and cardiology, PACS systems present medical images to physicians via intranet. Images presented through PACS systems have replaced all movie-based images. Patient-centered storage of non-DICOM images is also available.

Level 2: The main assistant clinical systems are hospitals where data fed from a single clinical data store (CDR) is enabled, or with fully integrated data stores for all order, result, radiology and cardiology images examined, and the clinician can access this data without a single user interface. Clinical databases are supported by basic medical disaggregation and prompt verification, clinical decision support (CDS) rules infrastructure for basic conflict control (level 1 decision support system: duplicate, gender controls, etc.). Information from the document imaging system may be linked to the clinical repository at this stage. Its basic security policies and competencies have been determined for physical access, acceptable use, mobile security, encryption, virus protection / malware protection and data corruption.

Level 3: Fifty percent (50%) of the nursing documents (eg vital signs, flow charts, caregiver notes, caregiver duties, care charts) have been created within the hospital (defining the formula hospital) and integrated into the clinical data pool. Fifty percent (50%) of the integration of nursing documents with the data pool should be provided through electronic data, and all electronic data in the hospital should be recorded in the clinical data pool. Technology should also be used in emergency departments, but emergency departments are excluded from the 50% rule. Electronic medication administration record (eMAR) application has been implemented. Role-based access control (RBAC) is implemented.

Level 4: Fifty percent (50%) of all medical orders are made through the computer provider order entry system (CPOE) by any clinician authorized to create an order. CPOE is supported by the clinical decision support

system (CDS) for basic dispute control and caregivers and requests added to the clinical repository environment. CPOE was used in the emergency department, but was not counted within the percentage rule set for the hospital as part of the digitalization process. At least ninety percent (90%) of the clinical documents used by nurses and ancillary healthcare personnel must be in electronic form. It should be ensured that nursing documents are available electronically in emergency departments, except for the 90% rule. If not confined to privacy, physicians can access the national or regional patient database to support decision making (eg drug therapy, imaging, vaccination, laboratory results, etc.). During the use of electronic medication administration record (eMAR), clinicians can access patient allergies, problem / diagnosis list, drug treatment and laboratory results. To detect network attacks, a potential network attack detection system must be available. (IDS-Intrusion Detection System) Nurses are supported by second-level clinical decision support systems when filling out documents related to evidence-based medical protocols (eg risk assessment scores that trigger recommended caregiver roles).

Level 5: Along with the structured templates, all physician documentation (eg progress reports, opinion reports, discharge statements, problem / diagnosis list etc.) and discrete data are applied in at least fifty percent (50%) of the hospital. Physician documentation should be operated in accordance with the rule of fifty percent (50%), but electronic processing of data in emergency departments is excluded from the rule of fifty percent (50%). Nursing work plans must be edited and monitored and reported on completion with task time. The IPS-Intrusion Prevention System must be available and used not only to detect possible attacks but also to prevent attacks. Portable devices that are defined and authorized to work on the hospital network can be wiped remotely if lost or stolen.

Level 6: The technology is used for drug, blood products and breast milk management, blood sample collection and monitoring in the realization of the closed loop process. Closed-loop processes are fully implemented in fifty percent (50%) of hospitals. This competence should also be applied

in emergency departments, but emergency departments are excluded from the 50% rule. Electronic medication administration record (eMAR) and technology are integrated with computer provider order entry system (CPOE), pharmacy and laboratory systems to maximize safe maintenance point processes and results. A more advanced level of the clinical decision support system provides "five correct rules" and other "rules" for drug management, blood products, breast milk management and blood sample processing. The advanced clinical decision support system provides, for example, a guidance initiated by at least the protocol in the form of variance and compliance alerts and physician documentation associated with the results (eg VTE risk assessment initiates the appropriate VTE protocol decision). Mobile / portable device security policy and applications have been applied to the devices of the user. The hospital provides an annual security risk assessment report to the management authority to take action.

Level 7: The hospital no longer uses paper to provide and manage patient care, and all patient data, medical images, and other documents are contained within the electronic medical records (EMR) environment. Data warehouse is used to analyze models of clinical data to improve health care quality, patient safety and efficiency. Clinical information can be easily accomplished with standardized electronic procedures (ie, CCD) or a health information exchange with all units authorized to treat patients (i.e. other non-related hospitals, outpatient clinics, subacute environment, employer, debtor and patients in the data sharing field). The hospital shows summary data continuity for all hospital services (eg inpatient, outpatient, electronic data, and any owned or managed bed treatment clinics). Physician documentation and electronic order are used at the rate of ninety percent (90%) (excluding all electronic data recorded in the hospital) and closed-loop processes at the rate of ninety five percent (95%) (excluding all electronic data recorded in the hospital).

HIMSS enables healthcare institutions to reach certain levels digitally. Health institutions need to reach these levels and make various investments. These can be

stated as consultancy, training, organization and hardware (IT devices, programs and hardware) costs (Nordic, 2018).

5.2. Adoption Model for Analytics Maturity (AMAM)

While organizations integrate technological innovations into their structures, analysis processes for activities are also among the most important activities of organizations. Based on this, the Adoption Model for Analytics Maturity (AMAM) was created to develop and measure the analysis capabilities of organizations. It develops many features of health institutions, especially foundation, economy, finance, clinical decision supports and operational aspects. AMAM is very important in the measurement of talents gained through the establishment of technology and surrounding processes in health institutions. As with EMRAM, AMAM has a total of eight different phases, starting from phase 0 to phase 7. Health institutions that want to benefit from AMAM in HIMSS execution complete the requirements and complete the development through expert-consultants in the field (HIMSS, 2017c).

Table 6: AMAM and Stages

Stage	AMAM Cumulative Capabilities
0	Fragmented point solutions
1	Foundation building: data aggregation and initial data govemance
2	Core data warehouse workout centralized database with an analytics competency center
3	Efficient, consistent internal and external report production and agility
4	Measuring and managing evidence-based care, care veriability, and waste reduction
5	Enhancing quality of care, population health, and understanding the economics of care
6	Clinical risk intervention & predictive analtytics
7	Personalized medicine & prescriptive analytics

(HIMSS, 2017c)

In AMAM, health institutions apply to HIMSS AMAM to document their scores (0-7). With the “AMAM Gap Report” created after the research made for the health institution after the application, the state of the existing structure is revealed and the necessary evaluations are made. After evaluating the report, the AMAM strategy is determined and the necessary road map for Stage 7 is created and the necessary activities are carried out. The verification process begins by AMAM after the activities are carried out. In this process, AMAM specialists carry out on-the-spot checks for the health institution, and all processes for AMAM (from the Gap Report to the roadmap and regulations) are reviewed and approved. In addition, when necessary, information and training activities for AMAM in health institutions can be provided by HIMSS-AMAM experts (HIMSS, 2017c; HIMSS, 2017d: 2).

5.3. Continuity of Care Maturity Model (CCMM)

Health institutions must observe the optimum periods in the service they provide to the society. So much so that service delivery to individuals does not take long periods and continues in a coordinated manner. The Continuity of Care Maturity Model (CCMM) has been developed by HIMSS in order to provide continuous and coordinated care of the services offered by health institutions to the community. CCMM is used in health institutions to understand and measure the ability to ensure continuity of care. All treatment processes of patients become standard with this model. Like EMRAM and AMAM, CCMM consists of 8 stages.

Table 7: CCMM and Stages

Stage	CCMM Cumulative Capabilities	
0	Limited or No E-Communication	Engaged in EMRAM maturation. Data is isolated. Governance is informal and undocumented.
1	Basic peer-to-peer data exchange	Limited shared care plans outside the organization. Leverage 3rd party reference resources. Basic alerts are in place. Some externally generated data incorporated into patient record. Policies for Continuity of Care strategy, business continuity, disaster recovery, and security & privacy are in place. Data governance is active.
2	Patient centered clinical data using basic system-to-system exchange	Patient record is available to multi-disciplinary internal and tethered care teams. EMR exchange is occurring on a limited basis. Immunization and disease registries for all patients. There is a patient-centered clinical data presentation. Pervasive electronic automated ID management for patients, providers, and facilities. Policies drive clinical coordination and semantic interoperability. Change management process is documented and standardized.
3	Normalized patient record using structural interoperability	Multiple entity clinical data integration. Regional/national PACS. Electronic referrals, consent are in place. Telemedicine is being used. Aggregated clinical and financial data. Medical classification and vocabulary tools are pervasive. Mobile tech supports point of care. Data governance across varied internal and external organizations is coordinated.
4	Care coordination based on actionable data using a semantic interoperable patient record	Shared care plans track, update, task coordination with alerts and reminders. E-prescribing. Pandemic tracking and analytics is in place. All care team members have access to all appropriate data. Semantic data drives actionable Clinical Decision Support and analytics. Comprehensive audit trails. Policies are in place for collaboration, data security, mobile device use, and interconnectivity between healthcare providers and patients.
5	Community-wide patient records using applied information with patient engagement focus	Community-wide patient record with integrated care plans and bio-surveillance. Patient data entry, personal targets, alerts are available. Patient data aggregated into a single cohesive record. Mobile tech engages patients. Community wide identity management. Best clinical practices are derived from care community healthcare data and operationalized across the community (continuous quality improvement and adaptation).
6	Closed loop care coordination across care team members	Dynamic intelligent patient record tracks closed loop care delivery and multiple care pathways/protocols for each patient along with patient compliance tracking. Organizational, pan-organizational, and community-wide Clinical Decision Support (CDS) and population health tracking. Policies address non-compliance.
7	Knowledge driven engagement for dynamic, multi-vendor, multi-organizational interconnected healthcare delivery model	Comprehensive pop-health. Completely coordinated care across all care settings. Integrated personalized medicine. Near real-time care community-based health record and patient profile. National and local policies are aligned.

(HIMSS, 2016)

In health institutions, CCMM cares about coordinating the necessary and critical skills for patient care. CCMM includes stakeholder groups in this process. These stakeholders and their activities are stated as follows:

1) Governance/Administrative leaders (COO, CEO, STK, CFO); Arranging agreements, approving policies and standards
2) Clinical leaders; (CNO, CMIO, CNIOs): Enabling and developing coordinated care by promoting clinical activities in the field of health,
3) Information Technology (IT) leaders (CIO): Developing and practicing important strategies for IT related developments

This model, which proposes a value-based approach, uses advanced analysis (advanced patient analysis, population health, etc.), coordinated patient care (coordinated treatment, minimum error, stimulation of care teams, etc.), health information sharing (health information exchange, inter-unit collaboration) and patient participation (mobile access, personal alerts, etc.) (HIMSS, 2016; 2016a).

5.4. Value Score

The development of technology affects many sectors in a tangible way day by day. Service-product efficiency has been increased to a high level in many sectors. The use of technology has been inevitable in order to improve the service in health institutions. Health institutions, as well as the use of technology, operational, clinical decision support and operational activities are also very important for the provision of health services. The ability of individuals applying to health services to benefit from these services efficiently is related to the adequacy of these activities. Therefore, the provision of these services of health institutions at adequate standards is necessary for the society. The value score (VS) model has been developed by HIMSS for the measurement of the operational capacities of operational, financial and clinical decision support systems in health institutions and especially their effectiveness (Saspam, 2018).

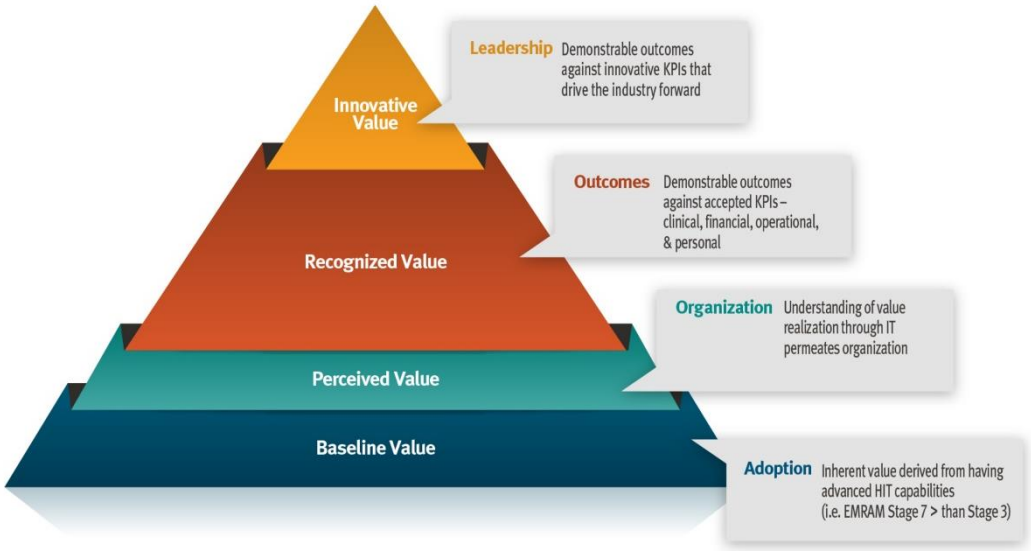

Figure 11: Himss Value Score

(Hernandez & Khamsombath, 2015)

VS model, which was developed in order to express the positive effect obtained from the investments for health ITs carried out by the health institutions, consists of different components as seen in the figure above. These components are in four groups: Baseline Value, Perceived Value, Recognized Value and Innovative Value. During the VS model application process, these four components are examined separately and joint evaluation is achieved (Wise, 2016, 2017).

VS model, which HIMSS developed and presented to health institutions, is one of the new generation standards in recent years. Health institutions are developing perspectives beyond the control and electronic record for all units with the VS model. Stephen Lieber (2015), who is the CEO of HIMSS, describes the VS model as “The Value Score is a combination of HIMSS' core competencies and is the natural next step in the continual evolution towards better care and outcomes for patients and providers” (cited by Hernandez & Khamsombath, 2015).

VS model, which aims to increase the efficiency of health services through the health technologies of health institutions, provides clinical performance increase and provides many contributions to the institutions that want to use this model. Some of the contributions of the VS model to the health institution are as follows (Wise, 2016):

- Creating a global evidence-based method for the evaluation of health institutions,
- increasing the trust in IT in the field of health, using it as well as providing growth,
- providing opportunities for organizations to benefit more from IT in the field of health,

5.5. Outpatient Electronıc Medical Record Adoption Model (O-EMRAM)

While health institutions around the world offer health services to communities with different names, public or private statuses, these services are generally performed as outpatient or inpatient treatment. Patients who are required to be treated or supervised in health institutions benefit from inpatient treatment, while patients who do not need this situation benefit from outpatient treatment. HIMSS has developed different standards for providing adequate level of service to healthcare institutions that provide outpatient and inpatient services. These standards are provided to outpatient healthcare institutions with EMRAM and outpatient health institutions with the Outpatient Electronic Medical Record Adoption Model (O-EMRAM) (HIMSS, 2015; Köse, 2019).

Health institutions in different countries have benefited from technology since the 19th century and used these technologies in the records. O-EMRAM, which is a road map in the optimization of electronic health records (EMR) in health institutions, has many features on behalf of health institutions as follows (HIMSS, 2015a);

- determining the usage levels of EMR systems in institutions in health services,
- comparison of technology adoption levels with other health institutions in the sector,
- planning progress and achievements in order to reach the highest level (stage 7), evaluating and implementing the required activities

With this model, tests are performed in the name of many clinician documents such as e-prescription writing, orders, population health analytics and patient participation. With O-EMRAM, it is aimed to contribute to the provision and follow-up of the most efficient service for healthcare services for patients. O-EMRAM for the development

of health care services consists of eight stages between 0-7 as in other models (EMRAM, CCMM, AMAM) in order to turn health institutions into paperless environments. These stages are indicated in the table below (HIMSS, 2015; 2015a).

Table 8: O-EMRAM and Stages

Stage	O-EMRAM Cumulative Capabilities	
0	Paper Chart Based	The organization is paper based without any online access to clinical content data or reference material.
1	Desktop Access To Clinical Information, Unstructured Data, Multiple Data Sources, Intra-Office/Informal Messaging	Physicians and nurses have desktop access to online reference material, patient eligibility information, and outside testing results in view-only mode.
2	Beginning Of A CDR With Orders And Results, Computers May Be At Point-Of-Care, Access To Results From Outside Facilities	The beginning of a Clinical Data Repository (CDR) exists where results from diagnostic tests reside no matter where they are generated. Other items in the repository at this point could be patient demographics, basic clinical documentation from nursing personnel, etc. are completed.
3	Electronic Messaging, Computers Have Replaced Paper Chart, Clinical Documentation And Clinical Decision Support	Charting is conducted and at point of care by nursing and support personnel who room the patient and record medication history, vital signs, some history of present illness, etc. Physicians maintain an on-line problem list and generate e-prescribing orders during the patient encounter.
4	CPOE, Use Of Structured Data For Accessibility In EMR And Internal And External Sharing Of Data	All types of orders are entered electronically into the record by the physician or other licensed provider during the patient encounter, and clinical decision support is interacting with the orders. Physicians are documenting in the record in structured templates that produce some discrete data for interaction with clinical decision support. All lab results are electronically imported and stored in discrete structured form enabling clinical decision support interactions. Reporting to various external registries such as state immunization registries, tumor registries, and others is electronically submitted.
5	Personal Health Record, Online Tethered Patient Portal	A patient portal exists with capabilities to see testing results, obtain patient education material, interact with caregivers, update demographic and allergy information, and schedule or request an appointment. At this point, there should be some evidence that the provider has activity to promote patient engagement, and a proportion of the patient population using the portal is known.
6	Advanced Clinical Decision Support; Proactive Care Management, Structured Messaging	Advanced clinical decision support such as protocols and pathways are in use and can be demonstrated. Health status and preventive care reminder flags are set and in use and can be demonstrated. Evidence exists and results can be shown of the beneficial use of the patient engagement program with improved health status indicators in the served patient population. There are some connected medical devices operating in the patient care areas. The clinic maintains and utilizes disease registries for case management and population health improvement.
7	Complete EMR: External HIE, Data Analytics, Governance, Disaster Recovery	The ambulatory facility no longer uses paper charts. The EMR has a mixture of structured documentation, discrete data elements to drive analytics and clinical advice, data from connected intelligent medical devices, images, test results, etc. The organization is participating in HIE with same vendor systems as well as other vendors. Disaster recovery and business continuity plans exist and are tested routinely. System governance is solid and has a demonstrable history of solving problems and adapting to requested change. Finally, the business and clinical analytics is very good and able to demonstrate improved patient care and improved population health through patient engagement.

5.6. Digital Imaging Adaptation Model (DIAM)

Health institutions offer many health-related services to society with different methods and technology products. One of these services is medical imaging. Considering that the technology is developing rapidly every passing period, the medical imaging departments of health institutions are affected by these developments and it is inevitable in the name of social health services. Increasing technology and the inclusion of mobile devices and imaging methods in medical imaging systems also have an impact on the management of these systems. However, it is possible for health institutions to be positively affected by these developments, as well as negative effects. Taking into account the complex and constantly evolving feature of medical imaging departments, it is very important to present imaging procedures safely between the right channel and the right person at the right time. For all these reasons, the Digital Imaging Adaptation Model (DIAM) has been revealed for the medical imaging departments as a collaboration of HIMSS, the Society of Imaging Informatics in Medicine (SIIM), The European Society of Radiology (ESR) and The European Society of Medical Imaging Informatics (EUSOMII). It is possible to determine and implement the most appropriate digital strategies for medical imaging centers and improve the health outcomes for patients with DIAM (HIMSS, 2016b; HIMSS, 2019; European Society of Radiology (ESR), 2019).

The preferred medical images in patients' health problems have become digital with the development of technology. Health systems are used in various systems (picture archiving and communication systems, radiology information systems) and archiving activities (EHR) used in medical imaging centers within health institutions. Developed to make these technologies in the medical imaging departments more practical and efficient by healthcare institutions, DIAM brings with it many practicalities. DIAM, which can be applied both in health institutions and in medical imaging centers cooperating with health institutions, plays an important role in the planning and implementation of health IT strategies in these departments. In addition, digitization of related technologies in medical imaging departments and elimination of problems encountered in development activities for patient records are among the objectives of DIAM (European Society of Radiology (ESR), 2019). DIAM has 8 different levels and these levels are in the table below (HIMSS, 2016b).

Table 9: DIAM and Stages

Stage	DIAM Cumulative Capabilities	
0	No Or Limited Electronic Image Management	The organisation has not installed key enterprise and/or specialized imaging information systems for imaging acquisition (orders or encounters based workflows), image related reports and/or clinical notes and image archiving electronically, in at least two service areas (image producing departments/units).
1	Electronic Image Management Covering The Service Area(S)	Key specialised medical imaging information systems are installed for managing image acquisition workflows (orders or encounters based workflows), imaging related reports and/or clinical notes, digital image archiving, in at least two departments/service areas. A supply and inventory management system, supporting the maintenance of inventory and consumables within the service area, may also be in place as appropriate, e.g. Radiology/Cardiology.
2	Electronic Image Management Covering A Variety Of Images Across The Enterprise	Images and associated reports/clinical notes, created in at least three image producing service areas or 80% of all medical images/videos produced in the organisation, are accessed via multiple, unique links within the EMR (or similar enterprise-wide user interface when an EMR is not available). External images can be imported to the organisation's image management system for clinician access (if policy allows).
3	Imaging Governance And Strategy; Workflow And Process Safety	An Enterprise Imaging Strategy exists and is in place, including appropriate governance and oversight. Clinical image acquisition and communication workflows are formalized, implemented and designed to support clinicians within their normal care processes. Quality, safety and operational parameters across multiple imaging services are measured and under control. Imaging specialists can access all types of images/multimedia from a single point of entry that connects them directly to specialty clinical viewers as needed. Clinicians across the enterprise can access images/multimedia through a consolidated viewer for non-diagnostic purposes. External referrers can access and view images through the organization's network/repository.
4	Fully Integrated Image Management With Efficient Enterprise-Wide Image Sharing Across Different Service Areas	The organisation makes use of an enterprise-centralized repository where image content is stored. Clinical image, multimedia and metadata capture and storage processes are standardised which enable order- and encounter-based image acquisition and sharing workflows across the enterprise. Internationally recognised standards, protocols or profiles are used to support system integration and clinical workflows. The organisation has the capability to securely acquire and view images via mobile platforms (e.g. mobile ultrasound) and handheld devices (e.g. smartphones). Image content, associated reports and clinical notes (DICOM/Non-DICOM; structured and non-structured reports) can be ingested and stored electronically. Clinicians may be able to access medical images and reports securely from remote locations.
5	*Stages 5-7 Are Non-Hierarchical And Can Be Adopted In Any Order* Advanced Imaging Analytics	*For Stages 5-7, these specialised stages can be adopted in any order* Clinical, organisational, and financial parameters are systematically tracked, benchmarked (internally and externally) and can be presented in real-time through Dashboards, Balanced Scorecards etc. The organisation uses internal and external data for making predictions about needed therapies and examinations, follow-up measures etc. Genetic information from patients is correlated with imaging biomarkers. Technology use is captured and analysed to influence user behaviour.
6	*Stages 5-7 Are Non-Hierarchical And Can Be Adopted In Any Order* Clinical Decision Support And Value-Based Imaging	*For Stages 5-7, these specialised stages can be adopted in any order* Systems are in place that are capable to provide feedback about the appropriateness to perform an examination, based on patient preconditions, history and approved guidelines. Alternative examinations and suggestions for standardised care practices/best-practice guidelines are directly integrated into the electronic workflow. Imaging reports/notes are in structured format and/or supported by natural language processing and produce discrete data elements that can trigger alerts and clinical decision support. Patient-specific imaging data from at least two image producing services are used and correlated in near-time with evidence-based information sources (commercial or self-developed) to improve health outcomes.

		The organisation participates in regional, national or international registries in order to track patient safety related information for Imaging.
7	*Stages 5-7 Are Non-Hierarchical And Can Be Adopted In Any Order* External Image Exchange And Patient Engagement	*For Stages 5-7, these specialised stages can be adopted in any order* The majority of image producing service areas are exchanging and/or sharing images and reports and/or clinical notes with care organisations of all types, including local, regional or even national health information exchanges based on recognized standards. The application(s) used in image producing service areas support multidisciplinary interactive collaboration. Patients can make appointments, access reports and images as well as educational content – specific to their individual situation – online. Patients may be able to electronically upload, download and direct the sharing of their images.

(HIMSS, 2016b)

The table above shows the 0-7 levels of DIAM. Level 0 has the lowest level of development, while Level 7 has the highest level of development. Moreover, the levels of 5,6 and 7 do not contain hierarchical ranking, the implementation order of health institutions may vary. In other words, it can be referred as:

- To reach Stage 7 all three of the Stage 5 through 7 criteria must be met
- To reach Stage 6 two-of-three of the Stage 5 through 7 criteria must be met
- To reach Stage 5 one-of-three of the Stage 5 through 7 criteria must be met

(HIMSS, 2016b).

CHAPTER 6
FINDINGS AND COMMENTS

In this part of the research, explanation of the demographical information of the sample group and the results of the analysis of the obtained data with the appropriate statistical method are included.

6.1. Validity and Reliability Analysis Results of Scales

At this stage, a validity and reliability analysis has been performed for the scale measured by the scoring scale of the scale used in the research section of the study. Cronbach's Alpha test statistics have been used for the validity and reliability of the survey questions.

The evaluation criteria applied in the evaluation of Cronbach's Alpha Coefficient;

If $0.00 \leq \alpha < 0.40$, the scale is not reliable.

If $0.40 \leq \alpha < 0.60$, the scale has low reliability.

If $0.60 \leq \alpha < 0.80$, the scale is very reliable.

If $0.80 \leq \alpha < 1.00$, the scale is highly reliable.

Table 10. Scale's Reliability Results

Cronbach's Alpha	Number of Items
0,900	44

In Table 1, it is seen that the reliability of the Health Information Technologies Scale is α = 0,900 and it is highly reliable, therefore these values are sufficient for the research.

Table 11. Descriptive Statistics of the Scale

Average	Variance	Standard Deviation	Number of Items
156,772	274,900	16,5801	44

As seen in Table 2, the average value of the Health Information Technologies Scale is distributed as 156.77 and its standard deviation is 16.58.

6.2. Interpretation of Frequency Tables

In this part of the research, collective frequency distribution tables related to personal information and scale in Chapter 1 in the survey form will be created and interpreted.

Table 12. Gender Distribution

	n	%	Valid %	Cumulative %
Male	133	26,6	26,6	26,6
Female	367	73,4	73,4	100,0
Total	500	100,0	100,0	

As can be seen in Table 3, 133 (26.6%) of the healthcare personnel constituting the sample are women and 367 (73.4%) are men.

Table 13. Age Distribution

	n	%	Valid %	Cumulative %
18-30	278	55,6	55,6	55,6
31-40	155	31,0	31,0	86,6
41-50	63	12,6	12,6	99,2
50 and over	4	0,8	0,8	100,0
Total	500	100,0	100,0	

As can be seen in Table 4, 278 (55.6%) of the healthcare personnel constituting the sample are 18-30 years old, 155 (31.0%) are 31-40 years old, 63 are (12.6%) 41- 50 years old and 4 (0.8%) are distributed as 50 years old and above.

Table 14. Educational Status Distribution

	n	%	Valid %	Cumulative %
High school	57	11,4	11,4	11,4
College	161	32,2	32,2	43,6
University	260	52,0	52,0	95,6
Master's Degree	16	3,2	3,2	98,8
PhD Degree	6	1,2	1,2	100,0
Total	500	100,0	100,0	

As can be seen in Table 5, 57 (11.4%) of the healthcare personnel constituting the sample are high school graduates, 161 (32.2%) are college graduates, 260 (52.0%) are university graduates, 16 (3,2%) are master's degree graduates and 6 (1.2%) are PhD graduates.

Table 15. Distribution of Working Experience in Hospital

	n	%	Valid %	Cumulative %
1-3 years	210	42,0	42,0	42,0
4-7 years	95	19,0	19,0	61,0
7-10 years	68	13,6	13,6	74,6
11 years and over	127	25,4	25,4	100,0
Total	500	100,0	100,0	

As can be seen in Table 6, 210 (42.0%) of the healthcare personnel constituting the sample have 1-3 years, 95 (19.0%) have 4-7 years, 68 (13.6%) have 7- 10 years and 127 (25.4%) have 11 years and over working experience.

Table 16. Title Distribution

	n	%	Valid %	Cumulative %
Hospital Administrator	1	0,2	0,2	0,2
Chief Physician	1	0,2	0,2	0,4
Deputy Chief Physician	1	0,2	0,2	0,6
Administrative and financial services manager	1	0,2	0,2	0,8
Administrative and financial services deputy manager	1	0,2	0,2	1,0
Healthcare services manager	1	0,2	0,2	1,2
Healthcare services deputy manager	1	0,2	0,2	1,4
Patient Services and Health Hotel Manager	1	0,2	0,2	1,6
Physician	16	3,2	3,2	4,8
Nurse - Midwife - Health Officer	353	70,6	70,6	75,4
X-Ray Technician	49	9,8	9,8	85,2
Anesthesia Technician	21	4,2	4,2	89,4
Lab Technician	30	6,0	6,0	95,4
Medical secretary	23	4,6	4,6	100,0
Total	500	100,0	100,0	

As can be seen in Table 7, 1 (0.2%) of the healthcare personnel constituting the sample is hospital manager, 1 (0.2%) is chief physician, 1 (0.2%) is deputy chief physician, 1 is (0.2%) administrative and financial services manager, 1 (0.2%) administrative and financial services deputy manager, 1 (0.2%) is health care services manager, 1 (0.2%) is health care services deputy manager, 16 (3.2%) are physicians, 353 (70.6%) are nurses-midwifes-health officers, 49 (9.8%) are x-ray technicians, 21 (%) 4.2) are anesthesia technicians, 30 (6.0%) are laboratory technicians and 23 (4.6%) are medical secretaries.

Table 17. Distribution of Experience Using Health Information Technologies System

	n	%	Valid %	Cumulative %
6 months and under	205	41,0	41,0	41,0
7 months- 1 year	197	39,4	39,4	80,4
2-3 years	85	17,0	17,0	97,4
6-7 years	8	1,6	1,6	99,0
8-9 years	4	0,8	0,8	99,8
10 years and over	1	0,2	0,2	100,0
Total	500	100,0	100,0	

As it can be seen in Table 8, 205 (41.0%) of the healthcare personnel constituting the sample have 6 months and under, 197 (39.4%) have 7 months-1 year, 85 (17.0%) have 2 -3 years, 8 (1.6%) have 6-7 years, 4 (0.8%) have 8-9 years, and 1 (0.2%) has 10 years and over working experience.

Table 18. Descriptive Statistics for Performance Expectations Expressions

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%	Average	SD
Health information technology helps speed up the business process.	16	3	25	5	61	12	239	48	159	32	4,00	0,96
Health information technology increases patient / customer satisfaction.	3	1	21	4	87	17	266	53	123	25	3,97	0,80
Health information technology increases the quality and efficiency of your service.	3	1	27	5	53	11	281	56	136	27	4,04	0,80
Health information technology improves accessibility and communication with the patient / customer.	0	0	25	5	97	19	236	47	142	28	3,99	0,82
Health information technology allows me to make fewer mistakes.	8	2	13	3	86	17	271	54	122	24	3,97	0,82

The frequency analysis of the respondents' responses to the statements of performance expectation statements can be seen in the Table 9. Accordingly:

The highest participation $\bar{\chi}$ = 4.04 and SD = 0.80 occurred in the statement of "Health information technology improves the quality and efficiency of your service."

The lowest rate of participation is in the statement "$\bar{\chi}$ Health information technology allows me to make fewer mistakes" with = 3.97 and SD = 0.82.

Table 19. Descriptive Statistics of Trust Perception Expressions

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%	Average	SD
I think the data provided by the health information system is reliable.	0	0	20	4	146	29	235	47	99	20	3,83	0,79
I believe it is risk-free to use the health information system.	10	2	70	14	147	29	198	40	75	15	3,52	0,98
I have a clear knowledge of the functions of health information systems.	61	12	44	9	221	43	185	37	10	2	3,46	0,84
I think that the safety and privacy of those who use and benefit from the health information system are protected.	11	2	54	11	142	28	248	50	45	9	3,52	0,88

The frequency analysis of the respondents' responses to the statements of trust perception statements can be seen in the Table 10. Accordingly:

The highest participation is in the item "$\bar{\chi}$ I think the data provided by the health information system is reliable" with = 3.83 and SD = 0.79.

The lowest level of participation is in the item "I have a clear knowledge of the functions of the health information systems" with = 3.46 and SD = 0.84.

Table 20. Descriptive Statistics of Risk Perception Expressions

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%	Average	SD
I am concerned about the frequent technical problems in the health information system,	9	2	43	9	83	17	226	45	139	28	3,89	0,97
I am afraid to make a mistake that cannot be corrected while using the health information system,	20	4	74	15	129	26	193	39	84	17	3,49	1,06
I worry that it will take me a long time to learn to use the health information system,	40	8	157	31	122	24	132	26	49	10	2,99	1,14

The frequency analysis of the respondents' responses to the statements of risk perception statements can be seen in the Table 11. Accordingly:

The highest participation is in the item “I am concerned about the frequent technical problems in the health information system.” with = 3.89 and SD = 0.97.

The lowest level of participation is in item "I worry that it will take me a long time to learn to use the health information system." with = 2.99 and SD = 1.14.

Table 21. Descriptive Statistics for Effort Expectation Expressions

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%	Average	SD
Health information technology can be used easily,	0	0	28	6	138	28	240	48	94	19	3,80	0,81
Health information technology helps facilitate your service,	0	0	26	5	106	21	287	57	81	16	3,85	0,75
You can easily fix the health information technology error / failure,	26	5	51	10	249	50	149	30	25	5	3,19	0,88
Your health information technology is always updated,	0	0	44	9	192	38	213	43	51	10	3,54	0,79
When an error occurs, health information technology resolves on its own,	61	12	127	25	195	39	89	18	28	6	2,79	1,05
Complying with Computer Security rules (passwords, backup, access restrictions) puts an extra strain on me,	17	3	72	14	107	21	197	39	107	21	3,61	1,08

The frequency analysis of the respondents' responses to the statements of effort expectation statements can be seen in the Table 12. Accordingly:

The highest participation is in item $\bar{\chi}$ "Health information technology helps streamline your service." with = 3.85 and SD = 0.75.

The lowest level of participation is in the item $\bar{\chi}$ "When an error occurs, health information technology resolves on its own." with = 2.79 and SD = 1.05.

Table 22. Descriptive Statistics for Social Impact Expressions

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%	Average	SD
Your colleagues expect your service to be better using the technology system,	3	1	20	4	115	23	265	53	97	19	3,87	0,79
Your colleagues think you can use technology efficiently,	6	1	20	4	130	26	259	52	85	17	3,79	0,81
Patients and relatives believe that the technology system is very useful for your organization,	6	1	70	14	175	35	199	40	50	10	3,43	0,89
Your healthcare business hires the information technology specialist staff to look after the information technology system,	19	4	53	11	250	50	144	29	34	7	3,24	0,87
There are enough staff in your healthcare business to handle information technology experts and related personnel,	43	9	97	19	227	45	124	25	9	2	2,92	0,92
Your managers support participating in training and seminars on education and new technologies,	9	2	30	6	205	41	196	39	60	12	3,54	0,85
Your Healthcare Information Technology specialist has a high level of experience,	25	5	79	16	252	50	115	23	29	6	3,09	0,9
Your Information Technology specialist can solve Health information technology problems,	16	3	32	6	215	43	201	40	36	7	3,42	0,84

The frequency analysis of the respondents' responses to the statements of social impact statements can be seen in the Table 13. Accordingly:

The highest participation is in the item $\bar{\chi}$ "Your colleagues expect your service to be better by using the technology system." with = 3.87 and SD = 0.79,

The lowest rate of participation is $\bar{\chi}$ = 2.92 and SD = 0.92 in the item "There are enough personnel in your healthcare service to take care of information technology experts and related personnel."

Table 23. Descriptive Statistics for Facilitating Conditions Statements

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%	Average	SD
Your healthcare business places emphasis on technology-driven service,	5	1	19	4	166	33	226	45	84	17	3,73	0,82
The healthcare company always develops and upgrades the information technologies system,	8	2	19	4	193	39	240	48	40	8	3,57	0,76
Your healthcare business has an Information Technology department,	13	3	22	4	141	28	252	50	72	14	3,70	0,86
Your healthcare company provides training for every employee on the system / technology,	8	2	26	5	208	42	206	41	52	10	3,54	0,81
Your healthcare business supports training for new employees employed by a professional trainer,	3	1	20	4	164	33	259	52	54	11	3,68	0,74
Your healthcare business supports capital investment in systems and technology,	3	1	15	3	292	58	170	34	20	4	3,38	0,64
Your healthcare business pays attention to bring new technology,	9	2	25	5	215	43	218	44	33	7	3,48	0,77
When other health tools bring the new technology, your health care will pay special attention,	0	0	32	6	194	39	258	52	16	3	3,52	0,67
When there is a new technology, your healthcare company always decides to try and buy the new technology,	11	2	60	12	229	46	188	38	12	2	3,26	0,78
You believe that the technology used in your healthcare business is better than other healthcare systems,	9	2	67	13	216	43	175	35	33	7	3,31	0,85

The frequency analysis of the respondents' responses to the statements of facilitating conditions can be seen in the Table 14. Accordingly:

The highest participation is $\bar{\chi}$ = 3.73 and SD = 0.82 in the item “Your healthcare business places importance on the technology-driven service.”

The lowest level of participation is = 3.31 and SD = 0.85 in item “You believe that the technology used in your healthcare business is better than other health systems. ”

Table 24. Descriptive Statistics of Behavioral Attitude Expressions

	Strongly Agree		Agree		Neutral		Disagree		Disagree		Total	
	n	%	n	%	n	%	n	%	n	%	Average	SD
I prefer to use the information technology system even when it is not mandatory.	18	4	110	22	159	32	158	32	55	11	3,24	1,03
I have difficulty using health information technologies.	53	11	136	27	154	31	107	21	50	10	2,93	1,14
Health information technologies increase the speed and quality of the service I provide.	22	4	38	8	182	37	198	40	58	12	3,47	0,95

The frequency analysis of the respondents' responses to the statements of behavioural attitudes can be seen in the Table 15. Accordingly:

The highest participation is $\bar{\chi}$ = 3.47 and SD = 1.03 in the item “Health information technologies increase the speed and quality of the service I provide.”

The lowest level of participation is $\bar{\chi}$ = 2.93 and SD = 1.14 in the item “I have difficulty using health information technologies.”

Table 25. Descriptive Statistics of Intention of Use Statements

	Agree		Neutral		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	Average	SD
You want to take advantage of new health information technologies to serve your patients / customers,	35	7	103	21	271	54	91	18	3,84	0,8
I believe in the necessity of using new technologies to increase efficiency by providing better quality service to patients / customers,	38	8	107	21	264	53	91	18	3,82	0,82
It was good to switch to the use of information technologies in the health system,	28	6	139	28	269	54	64	13	3,74	0,75
I believe that the scope of health information technologies should be expanded,	13	3	103	21	258	52	126	25	3,99	0,75
I believe that I will use health information technologies in the future,	23	5	123	25	246	49	108	22	3,88	0,8

The frequency analysis of the respondents' responses to the statements of intention of use statements can be seen in the Table 16. Accordingly:

The highest participation is = 3.99 and SD = 0.75 in the item "I believe that the scope of health information technologies should be extended."

The lowest level of participation is $\bar{\chi}$ = 3.74 and SD = 0.75 in the item "It was good to switch to the use of information technologies in the health system."

Table 26. Variety Analysis by Gender

		N	Average	Standard Deviation	t	p
Performance Expectancy	Male	133	4,07	0,68	1,599	0,111
	Female	367	3,97	0,66		
Perception of Trust	Male	133	3,67	0,74	1,933	0,054
	Female	367	3,55	0,61		
Risk Perception	Male	133	3,21	0,86	**-4,395**	**0,000**
	Female	367	3,54	0,70		
Expectation of Effort	Male	133	3,44	0,44	-0,721	0,471
	Female	367	3,47	0,51		
Social impact	Male	133	3,39	0,70	-0,643	0,521
	Female	367	3,42	0,50		
Facilitating conditions	Male	133	3,51	0,51	-0,096	0,923
	Female	367	3,52	0,47		
Behavioral Attitude	Male	133	3,30	0,63	1,951	0,052
	Female	367	3,18	0,60		
Intention of Use	Male	133	3,99	0,60	**2,883**	**0,004**
	Female	367	3,80	0,66		

As seen in Table 17, the difference between the arithmetic averages of the groups was not statistically significant as a result of the independent group t test conducted to determine whether the performance expectation scores differ significantly according to the gender variable. (p> 0.05).

The difference between the arithmetic means of the groups was not statistically significant as a result of the independent group t test conducted to determine whether confidence perception scores differ significantly according to the gender variable. (p> 0.05).

The difference between the arithmetic averages of the groups was statistically significant as a result of the independent group t test conducted to determine whether the risk perception scores differ significantly according to the gender variable. ($p < 0,05$). In other words; it is seen that the average risk perception of women is higher than men.

The difference between the arithmetic means of the groups was not statistically significant as a result of the independent group t test conducted to determine whether effort expectancy scores differ significantly according to the gender variable. ($p> 0.05$).

The difference between the arithmetic means of the groups was not statistically significant as a result of the independent group t test conducted to determine whether social impact scores differ significantly according to the gender variable. ($p> 0.05$).

The difference between the arithmetic means of the groups was not statistically significant as a result of the independent group t test conducted to determine whether facilitating conditions scores differ significantly according to the gender variable. ($p> 0.05$).

The difference between the arithmetic means of the groups was not statistically significant as a result of the independent group t test conducted to determine whether behavioral attitudes scores differ significantly according to the gender variable. ($p> 0.05$).

The difference between the arithmetic averages of the groups was statistically significant as a result of the independent group t test conducted to determine whether the intention of use scores differ significantly according to the gender variable. ($p < 0,05$). In other words; it is seen that the average intention of use of men is higher than women.

Table 27. Variety Analysis by Age

		N	Average	Standard Deviation	F	p	Difference
Performance	18-30	278	3,94	0,66	2,376	0,069	
Expectancy	31-40	155	4,03	0,71			
	41-50	63	4,16	0,59			
	50 and over	4	3,60	0,46			
	Total	500	3,99	0,67			
Trust	18-30	278	3,55	0,64	**5,88**	**0,001**	41-50> 18-30
Perception	31-40	155	3,52	0,67			41-50> 31-40
	41-50	63	3,89	0,56			41-50 > 50 and over
	50 and over	4	3,25	0,00			
	Total	500	3,58	0,65			
Risk	18-30	278	3,47	0,69	**9,843**	**0,000**	41-50> 18-30
Perception	31-40	155	3,27	0,86			41-50> 31-40
	41-50	63	3,86	0,64			
	50 and over	4	3,50	0,19			
	Total	500	3,46	0,76			
Effort	18-30	278	3,42	0,46	**2,665**	**0,047**	31-40 > 50 and over
Expectancy	31-40	155	3,49	0,54			41-50 > 50 and over
	41-50	63	3,60	0,50			
	50 and over	4	3,25	0,10			
	Total	500	3,46	0,49			
Social	18-30	278	3,44	0,54	**8,422**	**0,000**	41-50> 18-30
Impact	31-40	155	3,26	0,57			41-50> 31-40
	41-50	63	3,65	0,51			
	50 and over	4	3,19	0,07			
	Total	500	3,41	0,56			
Facilitating	18-30	278	3,44	0,45	**21,03**	**0,000**	41-50> 18-30
Conditions	31-40	155	3,48	0,48			41-50> 31-40
	41-50	63	3,93	0,36			
	50 and over	4	3,70	0,35			
	Total	500	3,52	0,48			
Behavioral	18-30	278	3,20	0,63	0,542	0,654	
Attitude	31-40	155	3,26	0,57			
	41-50	63	3,17	0,64			
	50 and over	4	3,00	0,00			
	Total	500	3,21	0,61			
Usage	18-30	278	3,83	0,68	1,260	0,288	
Intention	31-40	155	3,84	0,69			
	41-50	63	4,00	0,41			
	50 and over	4	3,70	0,35			
	Total	500	3,85	0,65			

As seen in Table 18, the difference between the arithmetic averages of the groups was not statistically significant as a result of the ANOVA conducted to determine whether the performance expectation scores differ significantly according to the age variable. ($p > 0,05$)

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether trust perception scores differ significantly according to the age variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that employees between the ages of 41-50 were higher than those with an average of perception of trust between the ages of 18-30, 31-40 and over 50.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether risk perception scores differ significantly according to the age variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that employees between the ages of 41-50 were higher than those with an average of perception of risk between the ages of 18-30, 31-40 and over 50.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether effort expectancy scores differ significantly according to the age variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that employees between the ages of 41-50 were higher than those with an average of effort expectancy between the ages of 18-30, 31-40 and over 50.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether social impact scores differ significantly according to the age variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc

results showed that employees between the ages of 31-40 and 41-50 were higher than those with an average of social impact between the ages of 50 and over.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether facilitating conditions scores differ significantly according to the age variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that employees between the ages of 31-40 and 41-50 were higher than those with an average of facilitating conditions between the ages of 50 and over.

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether behavioral attitudes scores differ significantly according to the age variable ($p > 0,05$).

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether intention of use scores differ significantly according to the age variable ($p < 0,05$).

Table 28. Variety Analysis According to Educational Status

		N	Average	Standard Deviation	F	p	Difference
Performance Expectancy	High school	57	3.85	0.72	**12.086**	**0.000**	College > high school College > University College > Master's degree School > PhD Degree
	College	161	4.25	0.58			
	University	260	3.91	0.67			
	Master's Degree	16	3.40	0.46			
	PhD Degree	6	3.80	0.00			
	Total	500	3.99	0.67			
Perception of Trust	High school	57	3.86	0.66	**9.787**	**0.000**	University > High School University > College
	College	161	3.69	0.52			
	University	260	3.50	0.68			
	Master's Degree	16	2.89	0.61			
	PhD Degree	6	3.50	0.00			
	Total	500	3.58	0.65			
Risk Perception	High school	57	3.49	0.65	**4.140**	**0.003**	College > University
	College	161	3.58	0.74			
	University	260	3.35	0.78			
	Master's Degree	16	3.44	0.53			
	PhD Degree	6	4.28	0.95			
	Total	500	3.46	0.76			
Expectation of Effort	High school	57	3.38	0.34	**6.290**	**0.000**	College > high school College > University College > Master's degree College > PhD Degree
	College	161	3.58	0.49			
	University	260	3.44	0.51			
	Master's Degree	16	3.14	0.44			
	PhD Degree	6	3.00	0.00			
	Total	500	3.46	0.49			
Social impact	High school	57	3.52	0.40	**12.839**	**0.000**	High School > PhD College > PhD Degree University > PhD Degree Master's Degree > PhD Degree
	College	161	3.46	0.62			
	University	260	3.41	0.51			
	Master's Degree	16	3.09	0.32			
	PhD Degree	6	2.00	0.00			
	Total	500	3.41	0.56			
Facilitating conditions	High school	57	3.55	0.53	**5.498**	**0.000**	College > University College >
	College	161	3.63	0.50			
	University	260	3.46	0.43			

	Master's Degree	16	3.25	0.64			Master's degree
	PhD Degree	6	3.20	0.00			
	Total	500	3.52	0.48			
Behavioral Attitude	High school	57	2.90	0.60	**6.924**	**0.000**	PhD Degree >
	College	161	3.34	0.66			High School
	University	260	3.18	0.57			PhD Degree >;
	Master's Degree	16	3.33	0.46			College
	PhD Degree	6	3.67	0.00			PhD Degree > University
	Total	500	3.21	0.61			
Intention of Use	High school	57	4.04	0.61	**6.509**	**0.000**	High School >;
	College	161	4.00	0.58			University
	University	260	3.72	0.69			College >
	Master's Degree	16	3.75	0.58			University
	PhD Degree	6	4.00	0.00			
	Total	500	3.85	0.65			

As seen in Table 19, the difference between the arithmetic averages of the groups was statistically significant as a result of the ANOVA conducted to determine whether the performance expectation scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average performance expectation of college graduates is higher than those of high school, university, master's and PhD graduates.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether trust perception scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average perception of trust of university graduates is higher than those of high school and college graduates.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether risk perception scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average perception of risk of college graduates is higher than those of university graduates.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether effort expectancy scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average effort expectancy of college graduates is higher than those of high school, university, master's and PhD graduates.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether social impact scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average social impact of high school, college, university, master's degree graduates is higher than those of PhD graduates.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether facilitating conditions scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average effort expectancy of college graduates is higher than those of university and master's graduates.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether behavioral attitude scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average behavioral attitude of PhD graduates is higher than those of high school, college and university graduates.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether intention of use scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the

post-hoc results showed that the average intention of use of high school and college graduates is higher than those of university graduates.

Table 29. Variety Analysis According to Working Experience in Hospital

		N	Average	Standard Deviation	F	p	Difference
Performance Expectancy	1-3 years	210	4.00	0.62	**6.570**	**0.000**	11 years and over >
	4-7 years	95	3.86	0.69			4-7 years
	7-10 years	68	3.81	0.48			11 years and over >
	11 years and over	127	4.18	0.77			7-10 years
	Total	500	3.99	0.67			
Perception of Trust	1-3 years	210	3.65	0.62	**9.842**	**0.000**	1-3 years > 4-7 years
	4-7 years	95	3.29	0.65			11 years and over >
	7-10 years	68	3.52	0.61			4-7 years
	11 years and over	127	3.73	0.64			
	Total	500	3.58	0.65			
Risk Perception	1-3 years	210	3.57	0.68	**8.045**	**0.000**	1-3 years > 4-7 years
	4-7 years	95	3.32	0.58			1-3 years > 7-10 years
	7-10 years	68	3.12	1.01			
	11 years and over	127	3.55	0.77			
	Total	500	3.46	0.76			
Expectation of Effort	1-3 years	210	3.46	0.46	**5.621**	**0.001**	11 years and over >
	4-7 years	95	3.36	0.46			4-7 years
	7-10 years	68	3.37	0.58			11 years and over >
	11 years and over	127	3.60	0.49			7-10 years
	Total	500	3.46	0.49			
Social impact	1-3 years	210	3.43	0.59	2.072	0.103	
	4-7 years	95	3.39	0.41			
	7-10 years	68	3.27	0.62			
	11 years and over	127	3.47	0.57			
	Total	500	3.41	0.56			
Facilitating conditions	1-3 years	210	3.46	0.46	**3.378**	**0.018**	11 years and over >
	4-7 years	95	3.49	0.43			1-3 years
	7-10 years	68	3.50	0.43			
	11 years and over	127	3.63	0.54			
	Total	500	3.52	0.48			
Behavioral Attitude	1-3 years	210	3.21	0.70	**3.395**	**0.018**	7-10 years >
	4-7 years	95	3.05	0.47			4-7 years
	7-10 years	68	3.30	0.34			11 years and over >
	11 years and over	127	3.29	0.64			4-7 years

	Total	500	3.21	0.61		
Intention of Use	1-3 years	210	3.85	0.72	0.255	0.858
	4-7 years	95	3.90	0.46		
	7-10 years	68	3.83	0.67		
	11 years and over	127	3.83	0.65		
	Total	500	3.85	0.65		

As seen in Table 20, the difference between the arithmetic averages of the groups was statistically significant as a result of the ANOVA conducted to determine whether the performance expectation scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-groups differ, the post-hoc results showed that the average performance expectancy of employees with an experience of 11 years and over graduates is higher than those with an experience of 4-7 and 7-10 years.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether trust perception scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that the average perception of trust of employees with an experience of 1-3 and 11 years and over is higher than those with an experience of 4-7 years.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether risk perception scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that the average perception of risk of employees with an experience of 1-3 years is higher than those with an experience of 4-7 and 7-10 years.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether effort expectancy scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which sub-

groups differ, the post-hoc results showed that the average effort expectancy of employees with an experience of 11 years and over is higher than those with an experience of 4-7 and 7-10 years.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether social impact scores differ significantly according to the education status variable ($p > 0,05$).

As a result of the ANOVA conducted to determine whether the facilitating conditions scores differ significantly according to the educational status variable, the difference between the arithmetic means of the groups was found statistically significant ($p <0.05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that the average facilitating conditions of employees with an experience of 11 years and over is higher than those with an experience of 1-3 years.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether behavioral attitude scores differ significantly according to the education status variable ($p < 0,05$). After the one-way analysis of variance (ANOVA) to determine which subgroups differ, the post-hoc results showed that the average facilitating conditions of employees with an experience of 7-10 and 11 years and over is higher than those with an experience of 4-7 years.

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether intention of use scores differ significantly according to the education status variable ($p > 0,05$).

Table30. Variety Analysis by Title

		N	Average	SD	F	p
Performance Expectancy	Hospital Administrator	1	4,2		1,241	0,246
	Chief Physician	1	3,6			
	Deputy Chief Physician	1	4			
	Administrative and financial services manager	1	5			
	Administrative and financial services deputy manager	1	5			
	Healthcare services manager	1	4			
	Healthcare services deputy manager	1	5			
	Patient Services and Health Hotel Manager	1	4			
	Physician	16	3,74	0,36		
	Nurse - Midwife - Health Officer	353	3,95	0,69		
	X-Ray Technician	49	4,1	0,59		
	Anesthesia Technician	21	4,17	0,62		
	Lab Technician	30	4,1	0,73		
	Medical secretary	23	4,17	0,56		
	Total	500	3,99	0,67		
Perception of Trust	Hospital Administrator	1	4		**3,237**	**0,000**
	Chief Physician	1	3,75			
	Deputy Chief Physician	1	4			
	Administrative and financial services manager	1	5			
	Administrative and financial services deputy manager	1	5			
	Healthcare services manager	1	4,75			
	Healthcare services deputy manager	1	5			
	Patient Services and Health Hotel Manager	1	3,75			
	Physician	16	3,11	0,97		
	Nurse - Midwife - Health Officer	353	3,56	0,62		
	X-Ray Technician	49	3,69	0,56		
	Anesthesia Technician	21	3,51	0,75		
	Lab Technician	30	3,48	0,65		
	Medical secretary	23	4	0,47		
	Total	500	3,58	0,65		
Risk Perception	Hospital Administrator	1	4		**3,775**	**0,000**
	Chief Physician	1	2			
	Deputy Chief Physician	1	1			
	Administrative and financial services manager	1	1,67			
	Administrative and financial services deputy manager	1	1,67			
	Healthcare services manager	1	1,67			
	Healthcare services deputy manager	1	1,67			
	Patient Services and Health Hotel Manager	1	4,33			
	Physician	16	3,23	1,18		
	Nurse - Midwife - Health Officer	353	3,51	0,64		

	X-Ray Technician	49	3,33	0,83		
	Anesthesia Technician	21	3,4	0,67		
	Lab Technician	30	3,62	1,03		
	Medical secretary	23	3,3	0,95		
	Total	500	3,46	0,76		
Expectation	Hospital Administrator	1	4		**2,481**	**0,003**
of Effort	Chief Physician	1	3,83			
	Deputy Chief Physician	1	4,17			
	Administrative and financial services manager	1	4,5			
	Administrative and financial services deputy manager	1	4,5			
	Healthcare services manager	1	4,5			
	Healthcare services deputy manager	1	4,5			
	Patient Services and Health Hotel Manager	1	2,67			
	Physician	16	3,35	0,59		
	Nurse - Midwife - Health Officer	353	3,45	0,48		
	X-Ray Technician	49	3,36	0,42		
	Anesthesia Technician	21	3,51	0,57		
	Lab Technician	30	3,58	0,56		
	Medical secretary	23	3,59	0,28		
	Total	500	3,46	0,49		
Social impact	Hospital Administrator	1	4,13		**1,753**	**0,048**
	Chief Physician	1	2,63			
	Deputy Chief Physician	1	4,13			
	Administrative and financial services manager	1	4			
	Administrative and financial services deputy manager	1	4			
	Healthcare services manager	1	4			
	Healthcare services deputy manager	1	4			
	Patient Services and Health Hotel Manager	1	3,75			
	Physician	16	3,3	0,41		
	Nurse - Midwife - Health Officer	353	3,41	0,54		
	X-Ray Technician	49	3,33	0,66		
	Anesthesia Technician	21	3,26	0,64		
	Lab Technician	30	3,41	0,51		
	Medical secretary	23	3,76	0,49		
	Total	500	3,41	0,56		
Facilitating	Hospital Administrator	1	4,6		**1,832**	**0,036**
conditions	Chief Physician	1	3,7			
	Deputy Chief Physician	1	3,9			
	Administrative and financial services manager	1	4			
	Administrative and financial services deputy manager	1	4			
	Healthcare services manager	1	4			
	Healthcare services deputy manager	1	4			
	Patient Services and Health Hotel Manager	1	3,9			
	Physician	16	3,6	0,57		
	Nurse - Midwife - Health Officer	353	3,49	0,49		

	X-Ray Technician	49	3,57	0,4		
	Anesthesia Technician	21	3,62	0,46		
	Lab Technician	30	3,35	0,43		
	Medical secretary	23	3,75	0,3		
	Total	500	3,52	0,48		
Behavioral	Hospital Administrator	1	4		0,76	0,703
Attitude	Chief Physician	1	2,67			
	Deputy Chief Physician	1	3,33			
	Administrative and financial services manager	1	3,67			
	Administrative and financial services deputy manager	1	3,67			
	Healthcare services manager	1	3,67			
	Healthcare services deputy manager	1	3,67			
	Patient Services and Health Hotel Manager	1	3,33			
	Physician	16	3,17	0,44		
	Nurse - Midwife - Health Officer	353	3,2	0,64		
	X-Ray Technician	49	3,14	0,49		
	Anesthesia Technician	21	3,44	0,68		
	Lab Technician	30	3,19	0,5		
	Medical secretary	23	3,35	0,47		
	Total	500	3,21	0,61		
Intention of	Hospital Administrator	1	4		0,882	0,573
Use	Chief Physician	1	4			
	Deputy Chief Physician	1	4			
	Administrative and financial services manager	1	4,4			
	Administrative and financial services deputy manager	1	4,4			
	Healthcare services manager	1	4,4			
	Healthcare services deputy manager	1	4,4			
	Patient Services and Health Hotel Manager	1	4			
	Physician	16	3,88	0,74		
	Nurse - Midwife - Health Officer	353	3,81	0,69		
	X-Ray Technician	49	3,84	0,43		
	Anesthesia Technician	21	3,8	0,52		
	Lab Technician	30	4,05	0,75		
	Medical secretary	23	4,13	0,34		
	Total	500	3,85	0,65		

As seen in Table 21, the difference between the arithmetic averages of the groups was not statistically significant as a result of the ANOVA conducted to determine whether the performance expectation scores differ significantly according to the title variable. ($p > 0,05$)

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether trust perception scores differ significantly according to the title variable ($p < 0,05$). After one-way analysis of variance (ANOVA) to determine which sub-groups differ, it was not possible to determine which sub-groups differed due to the groups with 1 participant as a result of post-hoc.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether risk perception scores differ significantly according to the title variable ($p < 0,05$). After one-way analysis of variance (ANOVA) to determine which sub-groups differ, it was not possible to determine which sub-groups differed due to the groups with 1 participant as a result of post-hoc.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether effort expectancy scores differ significantly according to the title variable ($p < 0,05$). After one-way analysis of variance (ANOVA) to determine which sub-groups differ, it was not possible to determine which sub-groups differed due to the groups with 1 participant as a result of post-hoc.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether social impact scores differ significantly according to the title variable ($p > 0,05$).

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether facilitating conditions scores differ significantly according to the title variable ($p < 0,05$). After one-way analysis of variance (ANOVA) to determine which sub-groups differ, it was not possible to determine which sub-groups differed due to the groups with 1 participant as a result of post-hoc.

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether behavioral attitudes scores differ significantly according to the title variable (p> 0,05).

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether intention of use scores differ significantly according to the title variable (p > 0,05).

Table 31. Variety Analysis According to the Experience of Using Health Information Technologies System

		N	Average	Standard Deviation	F	p
Performance Expectancy	6 months and under	205	3.99	0.73	0.380	0.863
	7 months- 1 year	197	4.03	0.61		
	2-3 years	85	3.93	0.68		
	6-7 years	8	3.88	0.44		
	8-9 years	4	3.80	0.00		
	10 years and over	1	4.00			
	Total	500	3.99	0.67		
Perception of Trust	6 months and under	205	3.62	0.51	**4.377**	**0.001**
	7 months- 1 year	197	3.53	0.66		
	2-3 years	85	3.71	0.85		
	6-7 years	8	3.13	0.46		
	8-9 years	4	2.50	0.00		
	10 years and over	1	3.00			
	Total	500	3.58	0.65		
Risk Perception	6 months and under	205	3.55	0.67	**6.636**	**0.000**
	7 months- 1 year	197	3.33	0.84		
	2-3 years	85	3.50	0.64		
	6-7 years	8	2.83	0.36		
	8-9 years	4	5.00	0.00		
	10 years and over	1	3.00			
	Total	500	3.46	0.76		
Expectation of Effort	6 months and under	205	3.52	0.43	**4.757**	**0.000**
	7 months- 1 year	197	3.44	0.54		
	2-3 years	85	3.47	0.49		
	6-7 years	8	3.15	0.37		
	8-9 years	4	2.50	0.00		
	10 years and over	1	3.00			
	Total	500	3.46	0.49		
Social impact	6 months and under	205	3.47	0.51	1.337	0.247

	7 months- 1 year	197	3.36	0.64		
	2-3 years	85	3.43	0.43		
	6-7 years	8	3.25	0.77		
	8-9 years	4	3.13	0.00		
	10 years and over	1	3.00			
	Total	500	3.41	0.56		
Facilitating conditions	6 months and under	205	3.50	0.45	1.556	0.171
	7 months- 1 year	197	3.52	0.50		
	2-3 years	85	3.58	0.45		
	6-7 years	8	3.56	0.72		
	8-9 years	4	3.00	0.00		
	10 years and over	1	3.00			
	Total	500	3.52	0.48		
Behavioral Attitude	6 months and under	205	3.20	0.61	2.121	0.062
	7 months- 1 year	197	3.30	0.57		
	2-3 years	85	3.05	0.69		
	6-7 years	8	3.21	0.40		
	8-9 years	4	3.00	0.00		
	10 years and over	1	3.00			
	Total	500	3.21	0.61		
Intention of Use	6 months and under	205	3.85	0.61	2.210	0.052
	7 months- 1 year	197	3.86	0.62		
	2-3 years	85	3.86	0.80		
	6-7 years	8	4.20	0.50		
	8-9 years	4	3.00	0.00		
	10 years and over	1	3.00			
	Total	500	3.85	0.65		

As seen in Table 22, the difference between the arithmetic averages of the groups was not statistically significant as a result of the ANOVA conducted to determine whether the performance expectation scores differ significantly according to the Health Information Technologies System Usage Experience variable. ($p > 0,05$)

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether trust perception scores differ significantly according to the Health Information Technologies System Usage Experience variable ($p < 0,05$). After one-way analysis of variance (ANOVA) to determine which sub-groups differ, it was not possible to determine which sub-groups differed due to the groups with 1 participant as a result of post-hoc.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether risk perception scores differ significantly according to the Health Information Technologies System Usage Experience variable ($p < 0,05$). After one-way analysis of variance (ANOVA) to determine which sub-groups differ, it was not possible to determine which sub-groups differed due to the groups with 1 participant as a result of post-hoc.

The difference between the arithmetic means of the groups was statistically significant as a result of the ANOVA conducted to determine whether effort expectancy scores differ significantly according to the Health Information Technologies System Usage Experience variable ($p < 0,05$). After one-way analysis of variance (ANOVA) to determine which sub-groups differ, it was not possible to determine which sub-groups differed due to the groups with 1 participant as a result of post-hoc.

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether social impact scores differ significantly according to the Health Information Technologies System Usage Experience variable ($p > 0,05$).

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether facilitating conditions scores differ significantly according to the Health Information Technologies System Usage Experience variable ($p > 0,05$).

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether behavioral attitude scores differ significantly according to the Health Information Technologies System Usage Experience variable ($p > 0,05$).

The difference between the arithmetic means of the groups was not statistically significant as a result of the ANOVA conducted to determine whether intention of use scores differ significantly according to the Health Information Technologies System Usage Experience variable ($p > 0,05$).

Table 32. Relation Analysis

		Performance Expectancy	Perception of Trust	Risk Perception	Expectation of Effort	Social impact	Facilitating conditions	Behavioral Attitude	Intention of Use
Performance	r	1							
Expectancy	p								
	N	500							
Trust	r	**0,372****	1						
Perception	p	**0,000**							
	N	**500**	500						
Risk	r	**0,170****	-,063	1					
Perception	p	**0,000**	,157						
	N	**500**	500	500					
Effort	r	**0,419****	**0,439****	-,043	1				
Expectancy	p	**0,000**	**0,000**	,342					
	N	**500**	**500**	500	500				
Social	r	**0,350****	**0,345****	,085	**0,518****	1			
Impact	p	**0,000**	**0,000**	,057	**0,000**				
	N	**500**	**500**	500	**500**	500			
Facilitating	r	**0,243****	**0,363****	,030	**0,498****	**0,635****	1		
Conditions	p	**0,000**	**0,000**	,510	**0,000**	**0,000**			
	N	**500**	**500**	500	**500**	**500**	500		
Behavioral	r	**0,378****	**0,139****	**0,120****	**0,379****	**0,303****	**0,323****	1	
Attitude	p	**0,000**	**0,002**	**0,007**	**0,000**	**0,000**	**0,000**		
	N	**500**	**500**	**500**	**500**	**500**	**500**	500	
Usage	r	**0,385****	**0,311****	-,027	**0,364****	**0,396****	**0,437****	**0,310****	1
Intention	p	**0,000**	**0,000**	,545	**0,000**	**0,000**	**0,000**	**0,000**	
	N	**500**	**500**	500	**500**	**500**	**500**	**500**	500

**p<0.01

In Table 23 it is seen that there is a positive and significant relationship between performance expectation and trust perception (r = 0.372), risk perception (r = 0.170), effort expectation (r = 0.419), social impact (r = 0.350), facilitating conditions (r = 0,243), behavioral attitude (r = 0.387) and intention to use (r = 0.385) (p <0.01).

It is seen that there is a relatively positive and significant relationship between perception of trust and expectation of effort (r = 0.439), social impact (r = 0.345), facilitating conditions (r = 0.336), behavioral attitude (r = 0.198) and intent to use (r = 0.311) (p <0.01).

It is seen that there is a positive and significant relationship between risk perception and behavioral attitude (r = 0.120) (p <0.01).

It is seen that there is a relatively positive and significant relationship between expectation of effort and social impact (r = 0.518), facilitating conditions (r = 0.498), behavioral attitude (r = 0.379) and intent to use (r = 0.364) (p <0.01).

It is seen that there is a relatively positive and significant relationship between social impact and facilitating conditions (r = 0.635), behavioral attitude (r = 0.303) and intent to use (r = 0.396) (p <0.01).

It is seen that there is a relatively positive and significant relationship between facilitating conditions and behavioral attitude (r = 0.323) and intent to use (r = 0.437) (p <0.01).

It is seen that there is a positive and significant relationship between behavioral attitude and intention of use (r = 0.310) (p <0.01).

CHAPTER 7
DISCUSSION RESULTS

7. CONCLUSION

This research has been realized in order to determine the adoption of health information technology and its effective usage by health care professionals using HIMSS modules 6-7 in the first two city hospitals belonging to the Ministry of Health in Turkey. 73.4% of the health personnel constituting the sample are male, 55.6% are between the ages of 18-30, 52% are university graduates, 42% have been working in the relevant hospital for 1-3 years, 70.6% are nurses, midwife, health officer, 41% has the experience of using health information technologies system for a maximum of 6 months.

Gender:

The average risk perception of women was higher than men. In a study conducted with 296 participants in Bangladesh by Alam et al. (2020), factors affecting the acceptance of technology used in healthcare services in developing countries were investigated. In the study, it was seen that performance expectation and effort expectation differ between men and women. Accordingly, it is among the findings that women's performance and effort expectations are higher than men'. In the study conducted by Hoque (2016) in Bangladesh with 227 participants, gender differences in the acceptance of technological developments in the field of health in developing countries were examined. In the study, it was observed that gender caused differences in behavioral attitude levels towards health services. It is seen that the concept of usefulness perceived for the use of technology in women is more and more adopted than men.

It was observed that the average intention of men to use was higher than that of women. The study, conducted by Alam et al. (2020), shows that the intention of men

to adopt and use technology is higher than women. In the study, it was also determined that gender did not differ significantly with perceived reliability and social impact. In the study conducted by Hoque (2016), it was determined that behavioral attitude and ease in men were higher than in women. Technology assumptions about the availability of online platforms in online health institutions were examined by Mendi and Akyazı (2016). According to the results of the study, it was observed that gender did not affect technology acceptance and did not differ.

In our study, significant superiority of various concepts was determined in men and women. There is a similar situation in the studies in the literature. However, there are findings indicating that gender does not differ significantly. It can be thought that the differences take place in the relevant departments in line with the ability of individuals to use technology in health institutions and their qualification levels.

Age

Employees between 41-50 years of age have higher perception of trust and expectation than those who are 18-30 years old, 31-40 years old and 50 years old. In the study conducted by Deng, Mo and Liu (2014) with the participation of 424 individuals in China, users' adoption of mobile technologies used in healthcare services were examined. Accordingly, it was observed that the group named as middle age (40-59) group had higher perception of trust and value than individuals in the advanced age group (over 59).

It has been observed that the risk perception of employees between the ages of 41-50 is higher than those between the ages of 18-30 and 31-40. Social effects and facilitating conditions of employees between the ages of 31-40 and 41-50 were higher than those aged 50 and over. Kamdjoug (2018) examined the technology assumptions used in health institutions in a study conducted with 228 health workers in Cameroon. In the study, it was determined that the social effect levels of individuals aged <40 years were higher than the other individuals in the age group of 40 and over. In the study conducted by Cimperman, Brencic and Trkman (2016) with 400 participants in Slovenia, the technology acceptance levels of individuals in the field of tele-health were examined. In the study, it was observed that there was no significant interaction between age and social impact. In the study conducted by

Mendi and Akyazı (2016), it was determined that age does not differ for technology acceptance in the field of health. In the study conducted by Yu, Li and Gagnon (2009) with 134 participants in Australia, IT acceptance factors in health care facilities were examined. In the study, there was no difference between age and technology acceptance levels.

Considering the findings of the study in the literature and the findings in the studies regarding the age concept, similar and different results draw attention. When similar findings are examined, it is understood that consistent results are obtained. However, it is another situation that the findings in different studies state that there is no significant change between age and technology acceptance concepts. It can be said that these differences vary depending on individuals' different experiences and competencies as well as their professional seniority. In other words, in the studies in which the findings of the age-related technology acceptance levels are not affected, it is thought that the participants have sufficient professional experience, the approaches regarding the technological acceptance of health institutions and the differences in the system-technologies used by the participants.

Education Status-Graduation

It has been observed that the performance expectations of the graduates of higher education are higher than those of high school, university, graduate and doctorate. It has been observed that the trust perception of university graduates is higher than that of high school and college graduates. It was observed that the risk perception of employees who graduated from college was higher than those who graduated from university.

It has been observed that the effort expectations of the graduates of college are higher than those of high school, university, graduate and doctorate. It has been observed that the social effect of the graduates of high school, university, master's degree are higher than those of doctorate. It has been observed that the effort expectations of the graduates of college are higher than those of university and master's degree. Behavioral attitudes of doctoral graduate employees were found to be higher than those of high school, college and university graduates. It has been

observed that the usage intention of high school and college graduates is higher than that of university graduates.

In the study carried out by Ye et al. (2019) with the participation of 474 users in China, the concepts affecting the acceptance of artificial intelligence technologies used in health services were investigated. In the study, it was determined that social impact, resistance perception, ease of use, risk perception and behavioral attitude did not differ significantly with graduations. In the study conducted by Cimperman, Brencic and Trkman (2016), it was determined that the educational levels do not affect the intention to use.

When the education level is taken into consideration, it is seen that our study findings are not similar to the findings in the literature. Health institutions regularly organize information and trainings on technology for their employees. In the studies carried out in countries other than Turkey (China and Slovenia), it is seen that the different findings may vary depending on organization periods, the content and types of these trainings, basic education and theory-practice-oriented technology of individuals in the early stages of educational life, and therefore do not vary according to the educational level of perception towards technology. In addition, it can be thought that the types of technology examined in the studies in the literature differ with the technology examined in our study and their knowledge levels are also affected in this direction.

Professional Seniority

Employees with 11 or more years of experience have higher performance and effort expectations than those with 4-7 and 7-10 years of experience. It has been observed that employees with 1-3 and 11 years or more experience have higher perception of trust than those with 4-7 years of experience. The risk perception of employees with 1-3 years of experience was found to be higher than that of employees with 4-7 and 7-10 years of experience.

It has been observed that the facilitating conditions of employees with 11 years or more are higher than those with 1-3 years of experience. It has been observed that the facilitating conditions of employees with 7-10 years and 11 years and above are

higher than those with 4-7 years of experience. In the study conducted by Yu, Li and Gagnon (2009), it was determined that the year of healthcare professionals' occupation does not significantly affect their perception of trust, performance, expectation of effort, risk perception and facilitating conditions.

Our study findings regarding the year of occupation and technology acceptance differed from the studies in the literature. It is thought that this difference arises from the fact that it may vary depending on the level of knowledge and experience of the research participants.

Interaction Between Each Other

Performance Expectancy (PE): As the perception of trust, perception of risk, expectation of effort, social impact, facilitating conditions, behavioral attitude and intention to use increases, the PE increases. In the study conducted by Kamdjoug (2018), it was determined that the PE increased with increasing EE and FE. In the study conducted by Cimperman, Brencic and Trkman (2016), it was seen that the perception of trust, effort expectation, facilitating effect, behavioral attitude and performance expectation were in positive interaction. In the study conducted by Wahab (2017) with 204 health workers in Iraq, the use of health technologies in private health institutions was examined. In the study, it was determined that there was no significant interaction between intention to use and PE.

Perception of Trust (PT): As the expectation of effort, social impact, facilitating conditions, behavioral attitude and intention to use increases, the perception of trust increases. In the study conducted by Alrazaq et al. (2019) with the participation of 624 patients, the concepts affecting the use of e-health records used in health services by individuals were examined. In the study, it was seen that PT increased positively with increasing PE. In the study conducted by Wahab (2017), it was observed that there was no interaction between intention to use and PT.

Risk Perception (RP): As the behavioral attitude increases, the risk perception increases. In the study conducted by Ye et al. (2019), it was determined that the increase of RP affects the usage intent of the users towards technology. The study conducted by Andrews, Hajanayake and Sahama (2014) with 750 participants

examined the perception levels of individuals in Australia regarding electronic health technologies. In the study, it was determined that RP had a direct effect on the intention to use and technology acceptance levels and caused negative changes. In other words, increasing RA decreases usage intent and technology acceptance.

Expectation of Effort (EE): As social impact, facilitating conditions, behavioral attitude and intention to use increase, expectation of effort increases. The findings of the study conducted by Alam et al. (2020) show that EE does not have any effect on BA. In the study conducted by Alrazaq et al. (2019), it was observed that with increasing PE, EE was positively affected by this situation. In the study carried out by Cimperman, Brencic and Trkman (2016), it was determined that computer anxiety was among the most important impacts of EE and had negative effects on EE. In the study carried out by Wahab (2016), it was determined that as the intention to use increases, the EE also increases.

Social Impact (SI): As the facilitating conditions, behavioral attitude and intention to use increase, the SI increases. The technology assumptions used in healthcare services were examined in the study carried out by Gladys et al. (2020) with 199 participants (patient, doctor and nurse) in Lebanon. The study suggested that as the intention to use increased, SI also increased. The factors determining the acceptance of mobile health technology services were examined in the study conducted by Lee et al. (2018), with 400 users in South Korea. In the study, it was determined that behavioral attitude, facilitating conditions, intention to use, and social effect were in direct interaction and a positive change was observed. Wahab (2016) determined that there is no interaction between intention to use and SI. In the study conducted by Bawack and Kamdjoug (2018), it was observed that SI had a direct and positive effect on technology adoption of healthcare professionals.

Facilitating Effect (FE): As the facilitating conditions, behavioral attitude and intention to use increase, the FF increases. In the study carried out by Gladys et al. (2020), it was observed that FE increased with the increase in behavioral attitude. In the research conducted by Lee et al. (2018), it was seen that FE is directly related to perceived benefit, intention to use and ease of use. It was observed that FE was positively affected by the increase in perceived benefit for technology. In the study

carried out by meta-analysis method by Zhao, Li and Zhang (2019), considering the 43 academic studies, online health method acceptance levels and economic development effects were examined in healthcare technologies. It was determined in the study that the increasing facilitating effect increased the acceptance of technology. In the study conducted by Wahab (2016), it was determined that the intention to use does not affect the FE.

Behavioral Attitude (BA): As the intention to use increase, the BA increases. In the study conducted by Alam et al. (2020), it has been determined that the material value of technological products and the increase of PT, SI, FE, EE and PE increase the BA for technology used in health services. Other findings of the study show that increasing BA increases the use of technology. In the study carried out by Wang et al. (2020) with the participation of 406 users, the use of technological wearable products developed in the field of health of users was investigated. In the study, it was observed that the tasks related to PE, EE, FE, SI and technology had a positive effect on BA in consumers. In the study conducted by Alam et al. (2020), it was determined that PE, SI, FE and perceived reliability of the individuals positively affect the BA to adopt technology use. It is also among the other findings that price and EE do not have an impact on this BA.

In the study carried out by Sarosa (2019) with the participation of 589 university students who continue their education in Indonesia, the perceptions regarding the use of technological products and services used for educational purposes in the university were examined. In the study, it was observed that the PE, EE, FE, SI and PT of the university students for brand affected the behavioral attitudes against technology positively. In the study conducted by Alrazaq et al. (2019), it was determined that PE, EE, PT, and confidentiality interact positively and significantly with BA, and that SI does not affect BA. In addition, it was determined that BA and FE positively affect the usage behavior. In the study carried out by Ye et al. (2019), it was determined that as the perceived benefit towards technology acceptance, FE, SI and intention to use increase, the BA also increases.

In the study conducted by Jewer (2018) with 118 participants in Canada, the intentions of the use of healthcare technologies for patients to wait in the emergency departments were examined. In the study, while PE and FE technology showed significant effects on BA, the effect of EE was not statistically significant. In the study carried out by Lee et al. (2018), it was seen that the perceived ease of use was found to have a direct negative interaction with BA. In addition, resistance to change, perceived usefulness, SI and FE were found to have a direct positive effect on BA. In the study conducted by Kamdjoug (2018), it was determined that PE, SI, EE and self-efficacy had a direct and positive effect on BA.

In the study conducted by Tavares and Oliveira (2017) with 597 participants in Portugal and the United States of America, admissions for electronic health records were examined. In the study, it was determined that EE, PE and SI affect BA and this was of the enhancer type. In the study carried out by Wahab (2016), it was determined that as the intention to use increases, the BA also increases. In the study conducted by Hoque (2016), it was determined that the perceived value of technology preferred in the field of health positively affects BA in users.

The study, which examined the factors for acceptance of information systems within the framework of UTAUT, was carried out by Oktal (2013) with the participation of 298 IT users. In the study, it was observed that PE, EE and FE were associated with BA and positively affected. In the study, it was also determined that SI did not significantly affect BA. In the study conducted by Alawadhi, SAM (2007) with the participation of 800 university students in Kuwait, the technology usage levels of students in public services were examined in developing countries. In the study, it was determined that PE, EE, peer effect and FE are direct determinants of technology use purpose and behavior. In addition, it was determined that internet experience and academic course type control the effect of the participants on the purpose and behavior of the participants and the use of new technology services was positively adopted by the participants. In the study, it was observed that the adoption of technology improved depending on the understanding of reform, the usability of technology, making the existing activity-services practical and fast. In cases where technology acceptance was negative, it was determined that the participants increased due to negative PT, fear and anxiety regarding technology.

It was observed that our study findings regarding PE, PT, RP, EE, SI, FE and BA differed mostly from the study findings in the literature. The fact that studies with similar findings are more than studies with different findings indicate the consistency of our study findings. It can be said that the inclusion of different findings depends on the technology differences used by the study participants and the non-employment of the participant group in the health sector.

SUGGESTION

It must be aimed to improve health information systems and increase the quality of service provision by foreseeing the contributions of service-oriented information technologies to the health system, in line with international standards, appropriate for the sociological, demographic and cultural structure of the employees. In the digitization process of hospitals starting with HIMSS, it is necessary to develop high level, effective, efficient and complex hospital information management system software that can work integrated with all hospital systems and units, to support the process with training, motivation and incentives for the sustainability of all processes and to ensure that the innovation, revision and adaptation processes of this system are managed very well. When we look at the international field, it is seen that the lack of physical infrastructure in Iran, inadequate in-service training in China, and the lack of training in information technology personnel in England, Australia and Canada negatively affect this process. In order to ensure the effective and efficient sustainability of the provision of health services in macro structure, trainings should be provided to increase the effectiveness of health information systems and technology use of both health professionals and patients who benefit from the service. It should be ensured that updated information is supported with new education models and made available to health professionals. While hospital management employs personnel working in Hospital Information Management Systems (HIMS) at every stage of the process, HIMS expert personnel should be available 24/7, where the personnel can easily reach and get support by prioritizing the employment of experts by adhering to the principles of merit.

Along with increasing the number of digital city hospitals across the country in coordination with international institutions and organizations in the provision of quality and efficient health services, it should be aimed to arrange the information and experience of institutions that provide standards for health services such as HIMSS in accordance with the country's conditions. The findings in the study and the findings regarding the gender and age variables in the literature have both similarities and differences. In order to examine the effects of these differences on technology acceptance in a more concrete way, conducting researches taking into account the relevant variables may contribute to the literature in this direction.

It was observed that our study findings regarding education level factor differed from the findings in the literature. In order to determine the causes of this difference, carrying out more detailed researches on education levels may reveal the cause of the problem. In the studies to be carried out for technology acceptance, it will be appropriate to examine at what level of education individuals are, as well as whether they have received technological education in these educational institutions, in addition to whether they are involved in technology education and information individually and institutionally in their professional life.

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ANNEXES

Annex 1: Ethics Committee Approval Letter

YAKIN DOĞU ÜNİVERSİTESİ

BİLİMSEL ARAŞTIRMALAR ETİK KURULU

31.07.2017

Sayın Yrd. Doç. Dr. Ihsan Tolga Medeni,

Bilimsel Araştırmalar Etik Kurulu'na yapmış olduğunuz YDU/SB/2017/48 proje numaralı ve **"Hastane İşletmelerinde Kullanıcıların Sağlık Bilgi Teknolohjilerinin Kabuliinü ve Kullanımını Etkileyen Faktörlerin Birleştirilmiş Teknoloji Kabulü ve Kullanımı Teorisi (UTAUT) Perspektifinden İncelenmesi"** başlıklı proje önerisi kurulumuzca değerlendirilmiş olup, etik olarak uygun bulunmuştur. Bu yazı ile birlikte, başvuru formunuzda belirttiğiniz bilgilerin dışına çıkmamak suretiyle araştırmaya başlayabilirsiniz.

Yardımcı Doçent Doktor Direnç Kanol

Bilimsel Araştırmalar Etik Kurulu Raportörü

Direnç Kanol

Not: Eğer bir kuruma resmi bir kabul yazısı sunmak istiyorsanız, Yakın Doğu Universitesi Bilimsel Araştırmalar Etik Kurulu'na bu yazı ile başvurup, kurulun başkanının imzasını taşıyan resmi bir yazı temin edebilirsiniz.

Annex 2: Plagiarism Report

ORIJINALLIK RAPORU

%13	%10	%7	%4
BENZERLIK ENDEKSI	İNTERNET KAYNAKLARI	YAYINLAR	ÖĞRENCI ÖDEVLERI

BIRINCIL KAYNAKLAR

1	www.himssanalytics.org İnternet Kaynağı	%3
2	Submitted to The Scientific & Technological Research Council of Turkey (TUBITAK) Öğrenci Ödevi	%1
3	SIRIN Ahmet, KADIOGLU Fahriye. "Investigation of the relationship between psychological counselors job satisfaction and self-esteem", Educational Research and Reviews, 2015 Yayın	%1
4	bmccancer.biomedcentral.com İnternet Kaynağı	%1
5	Özsoy-Güneş, Zeliha, İbrahim Güneş, and Merve Kırbaşlar. "Investigation of the Relationships between Educational Internet Use Self-efficacy Beliefs and Self-regulated Learning Skills", Procedia - Social and Behavioral Sciences, 2014. Yayın	<%1

RESUME

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2013-2014 T.C. Avrupa Birliği Bakanlığı Ulusal Ajansı Leonardo Da Vıncı Plm (İş Piyasasındaki Kişiler) Leo 02-50708 Nolu Proje (İsviçre-Hollanda) (Proje Sahibi - Sertifikalı Proje Yürütücüsü)

2013 T.C. Sağlık Bakanlığı Kamu Hastaneleri Kurumu Yoğun Bakım Hemşireliği Sertifikası

Uzmanlık Alanı:

Derece	Bölüm/Program	Üniversite	Yıl
Lisans	Hemşirelik	Atatürk Üniversitesi	2012
Y. Lisans	Sağlık Yönetimi -Tezli	OKAN Üniversitesi	2016
Doktora	İşletme Yönetimi	Yakın Doğu Üniversitesi	
Doç. / Prof.			

Yüksek Lisans Tez Başlığı (özeti ekte) ve Tez Danışman(lar)ı:

Sağlık Çalışanlarının Evde Sağlık Bakım Hizmetlerinin Sürdürülebilirliği Konusundaki Algı Düzeyinin Belirlenmesine Yönelik Bir Saha Çalışması

Tez Danışmanı: Yrd. Doç. Dr. Neşe ÇAPRAZ

Görevler:

Görev Unvanı	Görev Yeri	Yıl
Hemşire	Samsun Büyük Anadolu Hastanesi - Dahiliye Servisi	1997-1999
Hemşire	Sivas–Yıldızeli / Güneykaya Sağlık Ocağı	2000-2002
Hemşire	Samsun–Havza Devlet Hastanesi – Pediatri Servisi	2002-2013
Hemşire	Samsun–Havza Devlet Hastanesi -Yoğun Bakım Ünitesi	2014-2017
Müdür	Samsun–Havza Devlet Hastanesi Sağlık Bakım Hizmetleri Müdürü	2018-2021

ESERLER

A. Uluslararası hakemli dergilerde yayımlanan makaleler:

A1.Hımss Kamu Hastane İşletmelerinde Sağlık Bilgi Teknolojilerinin Kabulünü Ve Kullanımını Etkileyen Faktörlerin Birleşik Teknoloji Kabul Ve Kullanım Teorisi Perspektifinden İncelenmesi.

Revısta Argentına De Clınıca Psıcologıca, Doı: 10.24205 / 03276716.2020.1141 Sf .1438

B. Uluslararası bilimsel toplantılarda sunulan ve bildiri kitaplarında (p*roceedings*) basılan bildiriler:

B1. - Evde Sağlık Bakım Hizmetlerinin Sürdürülebilirliği Konusunda Sağlık Çalışanlarının Algı Düzeyinin Belirlenmesine Yönelik Bir Alan Araştırması - 4. Ulusal Ve Uluslararası Katılımlı Evde Sağlık Ve Bakım Kongresi (23-25 Kasım 2017)

B2.Evde Sağlık Bakım Hizmetlerinin Avrupa Uygulamaları (23-25 Kasım)