



THE EFFECT OF QUALITY ATTRIBUTES ON
CONTINUANCE INTENTION TO USE HOSPITAL
INFORMATION SYSTEMS IN AL-SHARJAH
CITY WITH SATISFACTION
AS THE MEDIATOR



KAMILIA ABDULMUTALIB MOHAMED JAD

SULTAN IDRIS EDUCATION UNIVERSITY

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ABSTRACT

This study aimed to determine the effect of the quality attributes of Hospital Information Systems (HIS), namely system quality, information quality and service quality, on patient satisfaction, the effect of quality attributes and patient satisfaction on continuance intention to use HIS, and the mediating effect of patient satisfaction in the relationship between quality attributes and continuance intention to use HIS. The study was also conducted to validate Delone and McLean's success model in the healthcare domain, particularly the adoption of HIS in Al-Sharjah City public and private hospitals. This study adopted a quantitative approach. A sample, which was made up of 500 outpatients aged above 18 years old, was selected using cluster sampling. Self-administered questionnaires were used as an instrument to collect the data. Structural Equation Modeling (SEM) was used to test the proposed hypotheses. The findings revealed that system quality ($\beta=0.409$, $p\text{-value}=0.00$), information quality ($\beta=0.331$, $p\text{-value}=0.00$), and service quality ($\beta=0.396$, $p\text{-value}=0.00$) have significant and positive effects on patient satisfaction. The findings also showed that system quality ($\beta=0.462$, $p\text{-value}=0.00$), information quality ($\beta=0.406$, $p\text{-value}=0.00$), service quality ($\beta=0.498$, $p\text{-value}=0.00$) and patient satisfaction ($\beta=0.767$, $p\text{-value}=0.00$) significantly and positively affect continuance intention to use HIS. The findings also revealed that patient satisfaction partially mediates the relationship between HIS quality attributes and continuance intention to use HIS ($p\text{-value}<0.05$). In conclusion, Delone and Mclean's success model is applicable in explaining the effect of quality attributes of information systems on patient satisfaction and the continuance intention to use HIS. In implication, to enhance patient satisfaction with the HIS and encourage its frequent use, Al-Sharjah public hospitals' management should focus on improving the quality attributes of the HIS, particularly the system quality, information quality, and service quality.





PENGARUH ATRIBUT KUALITI TERHADAP KESINAMBUNGAN NIAT MENGUNAKAN SISTEM MAKLUMAT HOSPITAL DI BANDAR AL- SHARJAH DENGAN KEPUASAN SEBAGAI PENGANTARA

ABSTRAK

Kajian ini bertujuan untuk menentukan pengaruh atribut kualiti Sistem Maklumat Hospital (HIS), iaitu kualiti sistem, kualiti maklumat dan kualiti perkhidmatan, terhadap kepuasan pesakit, pengaruh atribut kualiti dan kepuasan pesakit terhadap kesinambungan niat menggunakan HIS, dan pengaruh pengantara kepuasan pesakit dalam hubungan antara atribut kualiti dan kesinambungan niat menggunakan HIS. Kajian itu juga dijalankan untuk mengesahkan model kejayaan Delone dan McLean dalam domain penjagaan kesihatan, khususnya penggunaan HIS di hospital awam dan swasta Bandar Al-Sharjah. Kajian ini menggunakan pendekatan kuantitatif. Sampel, yang terdiri daripada 500 pesakit luar berumur 18 tahun ke atas, dipilih menggunakan pensampelan berkelompok. Soal selidik tadbir sendiri digunakan sebagai instrumen untuk mengumpul data. Permodelan Persamaan Berstruktur (SEM) digunakan untuk menguji hipotesis yang dicadang. Dapatan kajian mendedahkan bahawa kualiti sistem ($\beta=0.409$, nilai- $p=0.00$), kualiti maklumat ($\beta=0.331$, nilai- $p=0.00$), dan kualiti perkhidmatan ($\beta=0.396$, nilai- $p=0.00$) mempunyai pengaruh yang signifikan dan positif terhadap kepuasan pesakit. Dapatan kajian juga menunjukkan bahawa kualiti sistem ($\beta=0.462$, nilai- $p=0.00$), kualiti maklumat ($\beta=0.406$, nilai- $p=0.00$), kualiti perkhidmatan ($\beta=0.498$, nilai- $p=0.00$) dan kepuasan pesakit ($\beta=0.767$, nilai- $p=0.00$) mempengaruhi secara signifikan dan positif kesinambungan niat menggunakan HIS. Dapatan turut mendedahkan bahawa kepuasan pesakit mengantara secara separa hubungan antara atribut kualiti HIS dan kesinambungan niat menggunakan HIS (nilai- $p<0.05$). Kesimpulannya, model kejayaan Delone dan McLean adalah berkesan dalam menjelaskan pengaruh atribut kualiti sistem maklumat terhadap kepuasan pesakit dan kesinambungan niat menggunakan HIS. Secara implikasinya, untuk meningkatkan kepuasan pesakit terhadap HIS dan menggalakkan penggunaannya secara kerap, pihak pengurusan hospital awam Al-Sharjah perlu memberi tumpuan kepada peningkatan atribut kualiti HIS, terutamanya kualiti sistem, kualiti maklumat, dan kualiti perkhidmatan.



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LIST OF ABBREVIATION

HIS	Hospital Information system
UAE	United Arab Emirates
IS	Information Systems
SEM	Structural Equation Modeling
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis

CHAPTER 1

INTRODUCTION

1.1 Introduction

Today, patient-centered healthcare is witnessing a wide reform. Globally, patients are demanding a privilege in their healthcare and expect a certain level of service, simplicity, and understanding of their needs from their healthcare providers (Al-Damen, 2017). Thereby, implementing specialized information systems to provide better healthcare services for patients becomes an essential requirement of modern hospitals around the world. Information is essential for medical professionals in order to make decisions. For example, the availability of reliable information, such as the history of diseases and vital functions, influences the ordering of medical tests. The inability to obtain this critical information when needed renders healthcare information systems inoperable. Furthermore, these systems must be well integrated into existing processes and systems in order to avoid undesirable consequences such as double work (Shaikha, 2014). Information technology has the potential to significantly improve

access process management. This is an important global trend that affects both mature and emerging health markets (Callen et al., 2013).

The interest behind these trends stems from the potential to reduce the complexity of multiple delay and paper-based systems, improve the capacity of healthcare systems to manage patients and their information, increase engagement with global health rules, regulations, and standards, and ensure patient availability. data to aid in more precise healthcare delivery (Yang et al., 2015). The patient's perspective is becoming increasingly important in order to improve medical services and the provision of high-quality medical information (Kuo et al., 2018). The term “patient satisfaction” refers to the state of happiness or pleasure that a patient experiences after seeking medical treatment in a health care facility. In this regard, good patient health care is the foundation of any hospital (Faiza et al., 2019). A seamless and user-friendly interface of the HIS plays a crucial role in enhancing the overall service quality, making it easier for patients to navigate and utilize the system effectively, and gaining the satisfaction of patients who use the HIS on a regular basis (Nguyen, 2023). Therefore, it is essential for hospitals to prioritize and continuously improve the service quality of their HIS to ensure patient satisfaction and increase their intention to continue using the system. Many studies have claimed that patient satisfaction is an accepted metric for determining the effectiveness of medical services in hospitals. Furthermore, patient satisfaction is an important criterion for the provision of healthcare services (Ganasegeran et al., 2015). Today, the opinions of patients are an important indicator of the interests of healthcare providers, allowing them to make appropriate decisions about the medical services provided to patients (Ganasegeran et al., 2015). As a result, patient-centered healthcare evaluation has gained prominence and has become a

defining feature of all healthcare systems, serving as a valuable indicator for measuring the success of service delivery, particularly in public-sector hospitals (Mohd & Chakravarty, 2014). The examination of the quality of health care from the perspective of the patient, including patient satisfaction, was an important component of the quality of health care evaluation (Teshome et al., 2019). As a result, this study will focus on patient opinions in order to assess the quality of information systems used in hospitals throughout the United Arab Emirates (UAE).

1.2 The healthcare system in UAE

The United Arab Emirates (UAE) is one of the countries where healthcare has reached a high level of quality. Medical treatments in the UAE are expected to cost 19 billion dirhams by 2023. As a result, investments in the health sector have grown significantly in recent years, with expenditures for ambulatory health care in the VAE totaling \$5 billion USD, as shown in Figure 1.1. Furthermore, the Ministerium for Economic Development in Dubai confirmed in 2020 that the pharmaceutical and medical device industry is one of the key sectors of the Dubai Industrial Strategy 2030.

The UAE is the world leader in terms of the number of healthcare facilities that have received international accreditation, as well as a confirmation of their success in their plans to ensure business continuity and the provision of efficient and high-quality healthcare services in accordance with the highest level of availability of evidence for the efficacy and management of the healthcare system. increased challenges and risks through proactive planning in order to ensure an appropriate response based on

infrastructure, technology, and the most recent medical technologies. In this regard, some official reports indicate that the growth of the UAE's healthcare sector is expected to reach 39,4 billion dirhams by 2025, with the Dubai healthcare market likely to play a key role in promoting the sector's expansion from 144 billion US dollars in 2020 to around 243 billion US dollars in 2023.

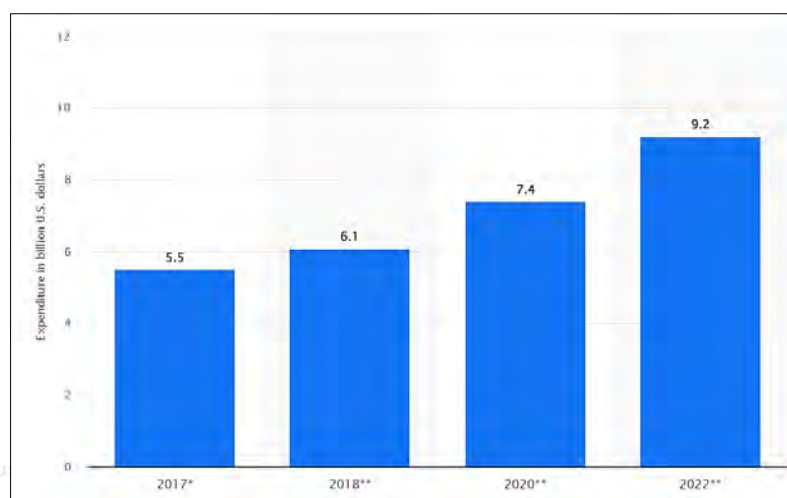


Figure 1.1. Outpatient healthcare expenditures in the United Arab Emirates from 2017 to 2022 in billion U.S. dollars (Statista, 2023).

Moreover, the average volume of health care spending per capita in the UAE is \$1,200, and the UAE also has the largest medical-free zone in the world, which consists of 160 medical partners. Across more than 150 specialties, in addition to specialists from 90 countries, these data indicate the economic opportunities available in the UAE health sector. To enhance the UAE's positive international reputation, the healthcare industry is given a high priority by the government. For this goal, the health sector witnessed some important developments, such as the use of robots in state hospitals and more adoption of HIS in private and public hospitals. The developments in the healthcare industry helped the UAE lead other well-known countries in healthcare in international indicators. Today, more than 85% of hospitals have achieved international

accreditation, according to the World Health Organization. The UAE leads the Middle East region in 19 indicators and measures to address public health risks. The country also topped nine global competitive indicators related to the extent of progress in achieving the third goal of the Sustainable Development Goals, which states “good health and well-being.” As a result, the usage of digital health products in the UAE has increased dramatically in 2022, especially after the COVID-10 pandemic, as shown in Figure 1.2.

In sum, the UAE's strategy to modernize and strengthen the country's health sector includes substantial efforts to support the country's rapid recovery capabilities and prepare to overcome future pandemics by integrating artificial intelligence and HIS into private and public hospitals. This will contribute to reducing the percentage of human errors and improve the quality of healthcare. To that end, the UAE continues its efforts to stimulate more investments in the health sector to meet the current and future needs of the country.

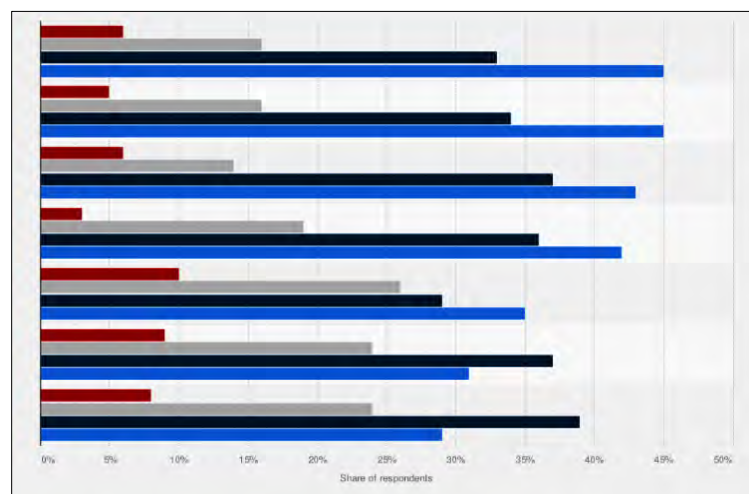


Figure 1.2. Usage frequency of digital health products in the UAE in 2022, by type (Statista, 2023)



1.2.1 Al-Sharjah healthcare system

The progress of nations and countries is measured by the progress of their services and infrastructure, which made the UAE deservedly surpass many developed countries around the world. This is distinguished by its basic and recreational services, which make it one of the best Arab cities in terms of caring for the comfort of citizens and residents, as Sharjah's healthcare system is a good example of the efficiency of medical service in its hospitals. Speaking of hospitals and health facilities in Al-Sharjah, the residents of this city are proud of the high quality provided by its medical institutions in terms of services and health care. Sharjah hospitals are among the best in the region in terms of modern technologies and medical personnel with high scientific and practical qualifications, in addition to the availability of well-known and world-class hospitals, including the following major hospitals:



Kuwait Hospital. The distinguished Kuwait Governmental Hospital tops the list of the best government hospitals in Sharjah, as it has achieved record numbers in the number of sick cases that it has treated during the past period. This hospital also provides the necessary medical services in various medical fields with high efficiency.

Al Qasimi Hospital. This hospital, which was established in 1991, is considered among the best hospitals in the Emirates, and Sharjah Governmental Hospital is the largest among the hospitals affiliated with the Ministry of Health, with more than 362 beds and more than 1,100 employees and workers. The hospital provides medical care services in many medical specialties, including heart diseases and surgery, internal medicine,





pulmonology, ear, nose, and throat, in addition to neurology, dialysis, eyes, dermatology, and many other specialties.

Zulekha Hospital. This hospital has been established in 2004. With a successful career that indicates the experience of the medical staff and the quality of services provided, today it includes more than 120 beds in various medical specialties. The hospital meets all the needs of patients and always strives to serve them under the slogan “distinguished medical services at prices that suit everyone”, which gave it an advanced position among the distinguished hospitals in Sharjah.

Oriana Hospital. This hospital is distinguished for providing medical care using modern technology, and with a guarantee of the lowest prices. The hospital is located on an area of 30 thousand square feet and includes various departments, such as the plastic department and the cardiology and pulmonary department. You can also take advantage of the dental services it provides, as it is considered one of the best hospitals that care for dental aesthetics and care.

Sharjah Corniche Hospital. With its privileged location near apartments for rent in Al Majaz, Sharjah Corniche Hospital is considered one of the most preferred hospitals among the residents of the region, due to the distinguished medical services it provides and the skilled medical staff that works with it.

Burjeel Hospital. This hospital is spread in many cities in the Emirates, so it is a well-known hospital. The hospital is located in an area of 16 thousand square feet and



includes 75 beds. It also provides medical services 24 hours a day and includes a distinguished international medical staff.

The Saudi-German Hospital. This hospital includes 50 beds, including 8 intensive care beds, and many neonatal care departments. The hospital includes a large number of qualified, experienced doctors who specialize in many fields.

Medicare Hospital. This hospital relies on modern technology and a cadre of distinguished doctors in treating its patients, which made it occupy a prominent position among the best hospitals in Sharjah. The hospital is famous for the quality of its orthopedic department, as it treats cases of ruptured ligaments, broken bones, and some spinal problems with high efficiency.

Kuwaiti hospital. This hospital recorded records in the number of medical cases it treated during the past periods. This hospital provides the necessary medical services in various medical fields, with high efficiency. The Kuwait Hospital in Sharjah has obtained an international accreditation certificate from the Joint Commission International for Accreditation of Health Institutions in the Middle East and North Africa (JCI), after its success in applying all the conditions and requirements for obtaining this accreditation.

The announcement of the achievement of Kuwait Hospital in Sharjah came after a committee of international arbitrators and experts completed remote verification operations using the latest technology in terms of flexible and interactive cameras and specialized audio devices to match the hospital's commitment to international best

practices in terms of clinical service quality, patient safety, and the efficiency of medical and administrative staff according to the best practices. internationally approved standards and protocols. The Ministry of Health is proceeding with determination and confidence to continue the international accreditation plan for all its facilities and the continuity of its health services in accordance with international quality standards thanks to the continuous support of the wise leadership and in line with the plans and aspirations of the UAE government to be more flexible and faster in making decisions and keeping pace with global developments in an effort to sustain achievements and adopt innovative thinking to ensure readiness for the future and proactive contribution to achieving the best levels of performance, maintaining the efficiency of sectors in the country and preserving national gains at all levels.

1.3 Background of study

The UAE has become known for its high-quality, technology-based healthcare. Almost all hospitals in the UAE, both public and private, use HIS. In order to compete with internationally branded hospitals, the UAE is known for emphasizing superior delivery of medical services (Li et al., 2015). As a result, it is critical to make the most effective choice of HIS models because their features impact how users accept the system and why they may use it regularly (Bleustein et al., 2014). However, the advancement of healthcare in this field is not without difficulties and problems, such as complains from users of HIS on missing of some quality attributes that should be available in the system like interoperability with other healthcare systems, user-friendly interfaces, and robust security measures. These complaints highlight the importance of continuously



improving and updating HIS models to meet the evolving needs and expectations of both healthcare providers and patients. By addressing these issues, the UAE can ensure that its healthcare information systems remain at the forefront of innovation and efficiency, ultimately benefiting the overall quality of healthcare services in the country.

Health is one of the most important criteria for the progress and well-being of any nation. Whereas information systems play a significant role in managing medical data and various processes to enable health facilities for outpatients to carry out their medical histories from home, every hospital at the present time needs to evaluate its service and the extent of the efficiency of its operations to satisfy patients. In this regard, HIS plays a significant role in enhancement of the medical service provided to the patients. However, the challenge faced by the hospitals and thus their online facilities, and offer high-quality healthcare services through Hospital Information System (HIS) is critical for maintaining the success in healthcare service (Itimad, 2021).

It is evident that, information systems have a substantial impact on the quality of medical care in hospitals around the world, including the UAE (Sangjae & Kun, 2020). While improving the quality of healthcare delivery is a global priority and the goal of healthcare quality enhancement initiatives is to ensure patient safety, improve clinical effectiveness, and encourage transparency (Teshome et al., 2019), effective execution of information systems in hospitals necessitates consideration of some system characteristics (Cacciabue & Vella, 2008; Zaineldeen et al., 2020). Kisekka and Giboney (2018) further mentioned that the healthcare industry today primarily relies on healthcare technologies such as electronic medical record systems, patient health record





systems, and technical devices to deliver patient care services. Therefore, the hospitals in UAE should consider that all quality attributes of their online systems have been met.

Furthermore, rising financial pressures and an increasing need for improved healthcare quality push most hospitals today to implement HIS to handle a plethora of medical service-related challenges (Kuo et al., 2018). To that end, modern hospitals makes wide use of information systems to make healthcare better and available for patients 24 hours. Accordingly, most stakeholders in hospitals agree that information technology such as HIS will be critical to transforming the healthcare industry (Saluvan & Ozonoff, 2018). Clearly, information management and health information technology are fundamental in all hospitals in the world (Myers et al., 2012).



healthcare technology to get patient satisfaction and a positive intention to use HIS in the medical service (Li et al., 2015; Alrahbi et al., 2021). The survey on the effectiveness of these HIS is critical to diagnose the absence of specific quality factors in these systems and what are their effects on patient satisfaction and overall outcomes. By conducting surveys and collecting feedback from patients, hospitals in UAE can identify areas for improvement and make necessary adjustments to enhance the overall patient experience. Through continuously evaluating and improving upon their HIS, hospitals can ensure that they are providing the best possible care and meeting the needs of their patients effectively. This focus on quality improvement will ultimately lead to higher levels of patient satisfaction and better health outcomes for all individuals involved.





By addressing these issues proactively, healthcare professionals can ensure a smooth transition and maximize the system's benefits. Additionally, knowing the perspective of outpatients regarding HIS will help Al-Sharjah hospitals as well as other hospitals in the UAE to ensure that the system meets their specific needs and preferences. Patients receiving serious and minor medical treatment should become accustomed to tracking their medical progress using technology and information systems. Hospitals in the UAE must take action to educate administrators and clinicians on why HIS promotes patient satisfaction and long-term use of the system for documenting medical history (Teshome et al., 2019). In other words, the effectiveness of HIS constitutes one of the factors that influence patient satisfaction; any flaws in these systems may reduce patients' willingness to utilize HIS on a regular basis. However, empirical research on the influence of HIS quality features on patients in UAE hospitals, particularly those registered for long-term medical care in public hospitals, is lacking. As a result, analyzing the quality features of HIS (system, information, and service) should provide evidence as to why patients intend or are hesitant to use the system indefinitely.

Ultimately, the goal of this study is to validate the D&M success model in the context of HIS. Accordingly, the outcome of this study will not only keep up with advancements in technology but also enhance our understanding of the impact of the quality attributes of HIS on the behavior of patients in the UAE. Each type of quality attributes in HIS is differ in benefit for the user (patient and output from the system, for example information quality enhance the medical information on patient medical history, systems quality enhances the acceptance of HIS by patients and their willingness to reuse the systems, while service quality improve the reputation of the





hospital in term of online service. These three quality attributes of HIS enhance ensure the competitiveness and sustainability of the hospitals. In addition to that, the previous arguments show that patient satisfaction is always an important factor when delivering any kind of service; this relationship has gained extra importance in the healthcare industry with the advancement of information systems (Teshome et al., 2019). In the same context, the continued intention to use HIS is another important factor used in the evaluation of information systems implemented in healthcare institutions.

1.4 Problem statement

It has been stated that HIS failures in the UAE have been ascribed to system complexity as a result of spending on HIS without an appropriate plan for successfully deploying HIS, e.g., poor HIS administration and execution. The benefit of HIS appears to be a difficult endeavor (Abouzahra, 2011; Al-Damen, 2017). Despite huge investments made to develop the HIS, many patients are reluctant to use it as they find it hard to use and lack of usefulness, and do not trust the technology to keep their personal information secure (Luo et al., 2024). This reluctance can hinder the effectiveness of the system and prevent patients from receiving the best possible care. It is important for healthcare providers to address these concerns and educate patients on the benefits of using HIS in order to improve overall health outcomes. Additionally, continued improvements in user interface design and data security measures may help to increase patient confidence in using HIS (Nguyen et al., 2023).





The intention to continuously use HIS is linked to patient satisfaction which is another challenge for hospitals. Thus, ensuring patient satisfaction with HIS most hospitals could not obtain easily, whereas the continued intention to use HIS by patients also depends on the quality attributes of HIS (Jad et al., 2022; Listyorini et al., 2022). However, this issue has been inadequately explored by researchers in the past, particularly in the UAE (Teshome et al., 2019). Some issues of quality attributes of HIS such as the accuracy of the output data and the completeness of medical reports (information quality), the availability of the output data (service quality), and the timing of the medical information (system quality). These factors could weaken users' continuous intention to use information systems of hospitals (Radhi & Mustakim, 2018). In other words, many studies focus on intention to use and not continuance intention to use, while other studies have focus on service quality and neglected the information quality and system quality parts or maybe these factors are researched in isolation. Therefore, it is crucial for future research to consider all aspects of quality attributes in HIS, including information quality, service quality, and system quality, in order to better understand continuance intentions to use the system. By taking a comprehensive framework such as D&M success model and examining all relevant factors, researchers can provide more accurate and valuable insights into how to improve the usability and effectiveness of HIS in healthcare settings. This holistic perspective will ultimately lead to more successful implementation and utilization of HIS, benefiting both healthcare providers and patients.

Despite the continuing growth of healthcare technologies within the healthcare sector, there is not much literature in the UAE that can explain how the success of new healthcare may be explained in a nutshell. There are several methods for determining



the success of information systems (IS). The Delone and McLean IS success model (D&M) is the most widely used and validated measure. The D&M model was first proposed in 1992 and was somewhat revised in 2003. The UAE's increasing expansion of healthcare technology is insufficient; there is a lack of a framework that can explain how the success of HIS contributes to patient satisfaction and increases the likelihood of using the system on a regular basis. Administrators and executives in public hospitals may be able to identify the qualities of HIS that most please patients by thoroughly assessing the impact of HIS on-healthcare services in UAE hospitals (Teshome et al., 2019). As a result, this study focuses on the parts of the D&M success model that improve patient satisfaction and intention to utilize HIS by critically analyzing the impact of this model on UAE hospitals' healthcare services. A vast body of literature supports the view that HIS affects patient satisfaction positively (Fatima et al., 2018; Lu et al., 2021; Li et al., 2022). Therefore, many hospitals in the world, including those in the UAE, adopted HIS. However, it is very important to evaluate patient satisfaction with HIS as well as the intention of patients to frequently use the system (Meesala & Paul, 2018). Hence, conducting a critical analysis of HIS success in UAE-based hospitals using the Delone and McLean (D&M) success model should achieve this objective. Furthermore, conducting thorough research and analysis on HIS will allow for the identification of any potential challenges or obstacles that may arise during the implementation of the healthcare information system in Al-Sharjah hospitals.

The literature shows well-known theories of information systems that have been used to understand the use of information systems include Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). While these theories have been widely used in the past to explain user behavior towards



technology, they may not be very effective in explaining the continuance intention to use HIS. This is where the D&M Success Model comes in, providing a more comprehensive framework for understanding the factors that influence the continued use of HIS in healthcare settings. So far, this study only explains that using D&M model remain the most holistic framework to solve the issues linked to continuous intention to use HIS. In this regard, the D&M success model is one of the most cited theories in the literature that explain how quality attributes of information systems affect the behavior of users (Salim et al., 2021; Iqbal & Rafiq, 2023). One way to better understand the behavioral drivers underlying healthcare professionals' and patients' intentions to use HIS is to investigate the impact of state-of-the-art IS models such as D&M in the healthcare industry (Vladimir et al., 2018). Unfortunately, there is a gap in the theory that does not cover the core technological characteristics in the medical system domain (Salleh et al., 2016). Despite limited academic work on this field, e.g., Zheng et al. (2023) applied the extended D&M success model for clinicians' use intention. Yet, such empirical investigations remain missing in the UAE healthcare system. Therefore, there is a gap in the literature regarding the factors influencing patient's continuous intention to use HIS in the UAE. It is crucial for researchers to conduct studies that explore these factors and provide insights into how technology adoption can be improved in the healthcare sector. By filling this gap, healthcare organizations in the UAE can better understand and address the challenges faced in implementing new technologies for improved patient care. In other sense, the literature on the continuance intention to use HIS is still limited in developing countries (Al-Damen, 2017), while in the UAE there is a lack of empirical evidence to measure the continuance intention to use HIS with accordance D&M success model, especially in



public hospitals in the UAE. All these issues will be discussed and evaluated in this research project.

Some studies reported that the implementation of HIS has not been very effective at all hospitals because of the lack of quality measures in the system (Lenny & Kridanto, 2019), while other referred that despite the large financial investment in the development and deployment of HIS, the outcome from using HIS as expected (Bazel et al., 2022). Although many studies available in literature have reported the delay in medical service due to unsuccessful implementation of HIS and link this issue to the acceptance or resistance of users towards these systems (Moghaddasi et al., 2018; Mohamed & Osama, 2015), there is still a lack of empirical evidence on HIS in the UAE healthcare sector. While the association between patient satisfaction and continued intention to use HIS has not been investigated in the past. However, it is still unclear what the main features of HIS are that are mostly influencing the intention and satisfaction of patients.

As aforementioned, limited research was carried out regarding patient satisfaction with HIS (Nguyen et al., 2014; Wang et al., 2022). The literature did not report the differentiation of patients' perspectives between quality attributes of HIS. Researchers need to measure the differences in the effect of these dimensions on patients or HIS users (Sven et al., 2017). Hence, the effectiveness of HIS may affects the continued intention to use HIS by patients in the hospital. But the question arises: to what extent are the quality attributes of HIS. To that end, the literature still lacking empirical reports on this gap and a framework that explain the relationships between



the quality attributes of HIS with continuous intention to use the system and patient's satisfaction.

In addition, the shortage of expertise in HIS implemented by UAE hospitals is another issue identified by researchers in the past. In UAE, almost all hospitals implement HIS, but some studies, e.g., Moghaddasi et al. (2018) found that the lack of expertise is among the main challenges to successfully adopting HIS in the healthcare system of UAE. They suggested that the use of successful experiences in operating HIS is critical to encourage patients and other users to continuously use HIS on regular bases. Likewise, Amal and Beharee (2015) reported various challenges linked to lack of expertise in Dubai hospitals that hinder a swift usage of HIS among Dubai's public and private hospitals. They also concluded that some management barriers affect providing qualified operator of HIS which worsen the problem arise from insufficient expertise in HIS domain, e.g., Ameera (2016) referred to poor management and execution of HIS (Ameera, 2016). Therefore, employees with adequate knowledge in this area are highly demanding, while the current staff who operate HIS need more knowledge and update on HIS technology.

The preceding arguments reveal considerable number of HIS failures due to various reasons as mentioned above in UAE hospitals. The findings of majority of studies in UAE healthcare environment reported obstacles, such as management barriers, lack of expertise, training, and complexity of systems or lack of quality HIS. In other words, the service quality, system quality, and information quality of HIS were not acceptable to the degree that attain high degree of satisfaction and intention among the patients and users of HIS. It is evident that scholars who have conducted studies on





healthcare and information systems have yet to establish the critical link between HIS quality attributes and overall satisfaction as well as the continued intention to use HIS.

In brief, the existing literature tends to focus on the relationship between health information technology implementation and health outcomes from a macro level, particularly focusing on organizational benefits, and there is still a lack of studies that investigate from a micro-level, particularly on individual benefits (patients) that may trigger satisfaction and a continued intention to use HIS (Baig, 2017). Despite there are few research investigated patient satisfaction, such as the study of The results of the study of Hamda et al. (2016) which revealed that the perceived healthcare services in private hospitals and public hospitals do not significantly vary. Although patients were more satisfied with nursing care, the perceived satisfaction of patients with the quality of services provided by physicians and nurses as well as the quality of the hospital environment do not significantly vary in both public and private hospitals. These individual benefits (patient satisfaction) need to be measured from the perspective of HIS quality attributes (Sven et al., 2017; Kuang-Ming et al., 2018; Upadhyai et al., 2019). Similarly, Kisekka and Giboney (2018) claimed that research on HIS is growing; nevertheless, there is a lack of empirical evidence based on a solid theory such D&M Success Model explaining how HIS quality attributes succeeds in influencing the satisfaction level and boosting the intention to use the system. Therefore, to address this theoretical gap, this study will investigate patients' satisfaction as a mediator and their continued intention to use HIS as a dependent variable by taking into account the role of quality attributes of HIS based on the D&M success model due to the familiarity of this model in explaining the effect of quality attributes of information systems on the behavior of users. The Literature did publish data from surveys in the past, whereas this



study is a novel academic work that report the reality of patient satisfaction on the current HIS used in Al-Sharjah hospitals.

1.5 Research objectives

The aim of this study is to determine the effects of quality attributes of HIS on-patient satisfaction and continuance intention to use HIS in Al-Sharjah hospitals, and consequently the effect of patient satisfaction on continuance intention to use HIS by using Delon and Mclean success model of information systems to achieve this aim. Specifically, this study attempts to achieve the following objectives.

- i) To examine the effect of system quality on continuance intention to use HIS.
- ii) To identify the effect of information quality on continuance intention to use HIS.
- iii) To determine the effect of service quality on continuance intention to use HIS.
- iv) To examine the effect of system quality on patient satisfaction towards HIS.
- v) To identify the effect of information quality on patient satisfaction towards HIS.
- vi) To determine the effect of service quality on patient satisfaction towards HIS.
- vii) To examine the effect of patient satisfaction on continuance intention to use HIS
- viii) To investigate the mediating role of patient satisfaction in the relationship between quality factors (system quality, information quality, and service quality) and continuance intention to use HIS.

1.6 Research questions

- i) What is the effect of system quality on continuance intention to use HIS?
- ii) What is the effect of information quality on continuance intention to use HIS?
- iii) What is the effect of service quality on continuance intention to use HIS?
- iv) What is the effect of system quality on patient satisfaction towards HIS?
- v) What is the effect of information quality on patient satisfaction towards HIS?
- vi) What is the effect of service quality on patient satisfaction towards HIS?
- vii) What is the effect of patient satisfaction on continuance intention to use HIS?
- viii) What is the role of patient satisfaction in the relationship between quality factors (system quality, information quality, and service quality) and continuance intention to use HIS?

1.7 Research hypotheses

Hypothesis 1 (H1): System quality has a significant effect on continuance intention to use HIS.

Hypothesis 2 (H2): Information quality has a significant effect on continuance intention to use HIS.

Hypothesis 3 (H3): Service quality has a significant effect on continuance intention to use HIS.

Hypothesis 4 (H4): System quality has a significant effect on patient satisfaction towards HIS.

Hypothesis 5 (H5): Information quality has a significant effect on patient satisfaction towards HIS.

Hypothesis 6 (H6): Service quality has a significant effect on patient satisfaction towards HIS.

Hypothesis 7 (H7): Patient satisfaction has a significant effect towards continuance intention to use HIS

Hypothesis 8 (H8): Patient satisfaction mediates the relationship between HIS system quality and continuance intention to use HIS.

Hypothesis 9 (H9): Patient satisfaction mediates the relationship between HIS information quality and continuance intention to use HIS.

Hypothesis 10 (H10): Patient satisfaction mediates the relationship between HIS service quality and continuance intention to use HIS.

1.8 Significance of study

This study will provide empirical evidence to policymakers in the Ministry of Health of the UAE, as well as to the leaders of hospitals in the Emirates, with respect to the role of HIS in fostering the quality of healthcare service. Knowing patients' experiences with healthcare service quality is critical for hospitals that seek top-class service. As HIS is an essential part of hospital service in modern countries (Wang et al., 2021), the result of this study will provide a clear picture of the reality of HIS in UAE hospitals, in particular in Al-Sharjah city. In addition, the developers of HIS benefit from the outcome and empirical findings to understand why the quality attributes of HIS must be completely fulfilled in these systems, and their application should become a mandatory standard for system development.

Considering the rapid advancements in technology and the increasing digitization of healthcare services in the UAE, it is crucial to understand how Delone and McLean's theory can be adapted to accommodate these changes. Additionally, the theory primarily focuses on the user's perspective and satisfaction, but it may not fully capture the intricacies of healthcare delivery and patient outcomes, which are key considerations in the application of HIS in UAE hospitals. Therefore, a more comprehensive evaluation framework that incorporates these factors may be necessary to accurately assess the success of HIS in the UAE.

As the value-added contribution to current knowledge does not necessarily mean totally new theories, this study validated the theory of Delon and Mclean in UAE hospitals. In other sense, while this study provided new indications to the body of knowledge on information system theories, in particular the Delon and McLean success models, the findings add new evidence to the relationship between quality attributes of HIS in the healthcare domain and patients' behavior towards HIS in terms of their continued intention to use and their satisfaction with replying to HIS in Al-Sharjah public and private hospitals. Thereby, the findings of this study filled the gap in the literature, whereas limited academic works have been done in the past in the healthcare domain, especially in the UAE. To that end, the concluded findings surely have advanced the knowledge of what factors motivate the patients to use HIS and what factors increase their intention to use it on a regular basis.



1.9 Operational definitions

Continuance intention to use HIS: It is a measure of patient willingness to use HIS. Before a patient decides to use information system, his/her attitude must show a certain level of intention for using the system (Karitis *et al.*, 2021). Thus, this variable reflects the readiness of patients to continuously access HIS for checking the medical update and reports on regular bases (Alsyounf & Ku, 2018). This variable is measured in this study through two dimensions, namely: actual use and frequent use.

Patient satisfaction. It is a measure of how patients are pleased and gratified to use HIS, often measured by overall user satisfaction. When patients are satisfied with HIS they will have a good attitude towards the system (Nguyen *et al.*, 2020). In this study, patient satisfaction will be measured by two dimensions, namely: fulfilment and acceptance.

System quality. It refers to the extent the HIS shows the standard quality attributes of an information system (Delone & Mclean, 1992). It is assumed in this study that when the patients find specific quality elements in HIS then the patients will have the desire and intention to reuse the system with full satisfaction for the advantages they get from the system (Karitis *et al.*, 2021). System quality is measured in this study through two dimensions, namely: ease of use and navigation.

Information quality: It refers to the richness of content and value of information they receive from HIS (Delone & Mclean, 1992). Patients are satisfied if HIS provide information in time, as well as accurate, reliable, and trustworthy information. It is





assumed in this study that when the patients find specific information quality elements in HIS then the patients should have the desire and intention to reuse the system with full satisfaction for the medical information they get from the system (Karitis *et al.*, 2021). Hence, in this study information quality of HIS is measured by two dimensions, namely: accuracy and completeness.

Service quality: It refers to the extent that HIS offer standard services for the patients who use the information system (Delone & Mclean, 1992). Patients expect that HIS provide fast responses to their requests with high reliability of service. It is assumed in this study that when the patients find specific quality elements in the service delivered by HIS then the patients will have the desire and intention to reuse the system with full satisfaction for the advantages they get from the system (Karitis *et al.*, 2021).

Thereby, in this study service quality is measured by two dimensions, namely: responsiveness and reliability.

1.10 Chapter Summary

This chapter introduces the issue of HIS and its function in hospitals in general, as well as the Al-Sharjah healthcare system. Then, show the primary obstacles and issues that compose the study's problem statement. Employing the Delon and Mclean success model of information systems, the objectives of this study are to assess the impact of HIS quality attributes on patient satisfaction and continuance intention to use HIS in Al-Sharjah hospitals, the effect of patient satisfaction on continuance intention to use HIS, as well as the mediating effect of patient satisfaction on the relationship between





system quality, information quality, and service quality with continuance intention to use HIS. The significance of the study and scope of the study sections outline the study's importance for policymakers and the information study's contribution to the body of knowledge on HIS. Finally, the operational definition includes a brief definition of the primary terminology utilized in the study as well as concept measures. Studying the D&M success model in information systems and its application in hospitals is crucial for several reasons. Firstly, information systems play a pivotal role in healthcare organizations, facilitating the efficient management of patient data, streamlining administrative processes, and improving overall healthcare delivery. Understanding the factors that contribute to the success of these systems can greatly enhance their implementation and utilization in hospitals, ultimately leading to improved patient outcomes and organizational performance. Additionally, the D&M success model provides a comprehensive framework for evaluating the effectiveness and impact of information systems, enabling researchers and practitioners to assess the value and benefits of these systems. This model takes into account different dimensions such as system quality, information quality, user satisfaction, and individual impact. By applying this model, healthcare organizations can identify areas for improvement and make informed decisions on how to optimize their information systems. The following chapter will examine the associated literature and theories in the context of information systems in healthcare institutions.

