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THE IMPACT OF ERP SYSTEMS ON MANAGEMENT ACCOUNTING PRACTICES AND PROFESSIONS: THE CASE OF HMC-QATAR

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ABSTRACT

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Title:_The Impact of ERP Systems on Management Accounting Practices and Professions: Case of HMC, Qatar

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This thesis explores the impact of enterprise resource planning (ERP) technology on management accounting practices (MAPs) in the public healthcare sector in Qatar. It aims to understand the effect of this technology on two critical groups of professionals in this field, namely clinicians and accountants. In addition, the research intends to examine the role of ERP in the relationship between these actors in the context of MAPs. Thus, the institutional logics perspective theory is adopted to develop a theoretical framework to deepen the understanding of each group's perspective, highlighting the alignment and misalignment among finance, clinical, and ERP logic. Further, it considers an interpretation of the clinicians' response to MAPs and their relationship with finance in light of ERP. To do so, this study adopted a qualitative research approach and a single case study as a research strategy. Data were principally obtained from 12 semi-structured interviews conducted with clinical managers and finance members at Hamad Medical Corporation (HMC), the main public healthcare organization in Qatar. In addition, secondary documents were used to triangulate the data, and a thematic analysis was used to analyze the interview data. This case study has implications for the implementation of ERP technology in both public and private healthcare organizations (HCOs), as it highlights the associated benefits and challenges of using ERP. In addition, it contributes to institutional logic and management

accounting research by re-evaluating the implementation of MAPs within ERP by providing a single case study and considering two conflicting groups of actors in public health. The results demonstrate that ERP logic affects the actors, when practicing MAPs, to varying extents based on their values, norms, and culture. The case study indicates that ERP logic is compatible with clinical logic in most aspects. At the same time, it appears to clash violently with ERP in terms of standardization, which was not the case for finance. In addition, the results show that ERP logic complements accounting logic, especially in control practice, while a number of contradictions appear as the accountants demand more transparency, and the accessibility seems to inflate their responsibility. The research thus highlights the similarities and differences of the two perspectives. Further, the research findings demonstrate that the accessibility and transparency of data in ERP engage clinical managers in the management process and lead to mitigate the contestation. Generally, the findings shows that ERP logic works as a mediator between the clinical managers and accountants when practicing MAPs.

DEDICATION

I dedicate this work to my beloved parents and sisters. I want to give special thanks to my mother for her continuous prayers for me. I also dedicate this research to my husband and my children and apologize for my shortcomings, with special thanks given to my husband for his endless support during this journey.

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Chapter 1: Introduction

1.1. Overview

The past decades witnessed the introduction of the new public management (NPM) concept by scholars like Christopher Hood. The concept is designed to encourage the public sector to emulate the private sector's practices, such as professional management, control, and efficiency. NPM inspired the public sector around the world, developing initiatives for reforms. The public sector has been forced to shift from a traditional approach to new management strategies (Massaro et al., 2015; Sandhu et al., 2011), given that globalization has removed barriers and increased awareness. Governments have become more oriented toward improving performance, efficiency, transparency, and accountability. Also, citizens now demand services from the public sector that meet the same level and standards as the private sector (Al Ahbabi, 2019). Overall, it has become necessary to adopt a private-sector approach in performance development (Bolton, 2003) in order to meet several types of accountabilities either toward the country or individuals. Meeting accountabilities is done by implementing the NPM process and managerial mechanisms to ensure the intended level of performance is obtained. NPM takes many forms. Also, automating the systems using ERP is a type of reformation and transformation adopted in public entities (Fernandez et al., 2018). Responding to the research gaps, this thesis aims to outline the interplay of imperative logics induced by ERP with the most relevant groups of professionals in the healthcare context, namely clinicians and accountants. It will present a case from Qatar, due to the scarcity of this kind of academic research in developing countries.

1.2. Background

ERP is an information system that consists of multiple modules, integrating the business processes, functions, and departments into a central database (Ganesh et al., 2014). The literature has emphasized the importance of an integrated information system technology within HCOs, such as ERP (Fiaz et al., 2018; Ilyas et al., 2016; Jenkins & Christenson, 2001; Mucheleka & Halonen, 2015). It results in significant change since it involves internal and external stakeholders and integrates the medical system with finance, enabling actors to work closely and unifying their objectives (Stefanou & Revanoglou, 2006). Clinically, integrated information systems bring about availability, help doctors make diagnoses and referral decisions, and ensure the privacy and security of patients' records (Mcnamara, 2000).

Concerning accounting in HCOs, accounting represents a significant tool, device, or practice in the strategizing process that enables the agents in pluralistic organizations to find potential solutions for the financial issues they might experience (Begkos et al., 2019). In addition, accounting practices are a continuous process, necessary for a dynamic and complex environment (Denis et al., 2006), such as HCOs. Prior studies confirmed the positive effect on MAPs (Ammar, 2017; Sánchez-Rodríguez & Spraakman, 2012; Spraakman et al., 2018), regardless of whether its effect is direct or indirect. Hence, this research will focus on the effect of ERP on MAPs in healthcare, given that ERP provides hospitals with efficient data sharing, reliability, and security and increases collaboration between actors, improving the decision-making processes (Khoumbati et al., 2006).

1.3. Research problem

This section explains the research area's motivations and delineates the research questions.

1.3.1. Research Motivations

There are number of motives that led to deciding on this research topic. Firstly, previous studies presented considerable findings from developed countries such as Sweden, the Netherlands, and Australia (Paulsson, 2012; Speklé & Verbeeten, 2014; Rana & Hoque, 2020). Also, the literature showed results of NPM in developing countries such as Malaysia (Rozai, 2016), African countries (Wanyonyi, 2019), and China (Cui et al., 2019). Research in an Arab country is rare. In this sense, only one study was found from Gulf Cooperation Countries (GCC) in particular, which reported on public sector reforms in Saudi Arabia (al Otaibi, 2015).

Regarding the public healthcare sector particularly, reforms, including accounting reforms and management mechanisms, have been reported in academic research like in Carlström (2012) and Nyland et al. (2017). Although a number of studies in such research contexts, the majority come from developed countries. For instance, in Norwegian hospitals, Modell (2001) investigated the performance measurement system, and Pettersen and Solstad (2014) explored the effect of using accounting information on clinical managers. In Italian hospitals, Adinolfi (2014) reported the healthcare reform difficulties, and Macinati and Rizzo (2016) investigated the involvement of clinical managers in managerial tools, such as budgeting. Also, research from Ireland by Carr and Beck (2020) explored the perception of clinicians of management mechanisms. Other studies in this field include ones from Portuguese hospitals, like in Silva et al. (2013), and from Dutch hospitals, like the work of Rouwelaar et al. (2021). However, similar studies from

developing countries are limited. Chol et al. (2018) reviewed studies in developing countries about healthcare; however, it was restricted to sub-Saharan African countries. There is absence of evidence from Arab countries.

Secondly, the literature is adequate with studies on such technology, which introduced ERP (Davenport, 1998; Ganesh et al., 2014; Umble et al., 2003), and other researchers explored the benefits and barriers of implementing the technology (Peng & Gala, 2014; Scholtz & Atukwase, 2016; Wang & Wei, 2014). The literature discussing ERP technology, in terms of management accounting in particular, is rich with considerable and conclusive results from the private sector (Ammar, 2017; Sánchez-Rodríguez & Spraakman, 2012; Scapens & Jazayeri, 2003; Seethamraju, 2015; Spraakman et al., 2015; Spraakman, 2018; Vakilifard et al., 2013).

Referring to the first motive of this study, this research will be narrowed to public healthcare sector. ERP/integrated information systems are type of NPM reforms. In this regard, studies presented evidence from developed countries like Italy and Greece (Chiarini et al., 2018; Stefanou & Revanoglou, 2006). In developing countries, ERP is investigated in the public sector in general without particular reference to healthcare (Fernandez et al., 2018; Primeau & Leroux, 2019; Scholtz et al., 2016). While limited knowledge shown from healthcare in developing countries (Fiaz et al., 2018; Ilyas et al., 2016). Discussing Arab countries area, academic research reveals evidence about ERP in public sector, particularly from GCC countries (Albataineh, 2013; Al-Harthi & Saudagar, 2020; Alsharari, 2017; Alsharari, 2021; Bukamal & Abu Wadi, 2016; Hassan & Mouakket, 2018). However, public healthcare in these countries was left unstudied, since available studies about ERP came from private hospitals like the work of (Almajali et al., 2016) in Jordan.

The research will select Qatar as a case study to investigate the reforms in public

healthcare, particularly in the context of the technology. It will explore the impact of ERP on MAPs due to the scarcity of research in the public sector more generally and the public healthcare sector in particular within these countries. Qatar's economic growth has accelerated since 1995, and now it is an economic leader in the Middle East (Government Communications Office, 2022), with one of the highest GDP per capita in the world (Qatar General Secretariat for Development Planning, 2011). Qatar has invested heavily in public healthcare in the past decades to improve service quality, especially with the Declaration of Qatar Vision 2030, all partners' efforts orientating toward achieving the vision, including healthcare. The efforts to improve healthcare in Qatar involved investing significantly in e-health due to the development of National E-Health and Data Management Strategy (2015). This played incredibility important role during COVID-19, besides additional efforts and investments during the pandemic, such as implementing the EHTERAZ application. EHTERAZ is a mobile application managed by related governmental entities in Qatar, such as the Ministry of Public Health (MOPH), to enhance precautionary measures (Hukoomi, 2022). More information will be given about Qatar's medical system history and reforms in the research methodology section (Chapter 4).

Thirdly, prior studies have examined the NPM process, including the managerial and non-managerial mechanisms that have been adopted in new management strategies to improve the healthcare sector regarding the roles of clinical and administrative (accounting) professionals in particular, considering their competitive relationship (Campanale & Cinquini, 2016; Fiondella et al., 2016; Oppi & Vagnoni, 2020; Pettersen & Solstad, 2014; Rautiainen et al., 2021; Silva et al., 2013). Other research has focused on exploring the clinicians' responses to new management tools (Carr & Beck, 2020; Macinati et al., 2021; Nyland et al., 2017).

This study aims to add to this knowledge by investigating the above professionals' perception of ERP as an institutional change and a reform tool to implement NPM mechanisms, given that this purpose was not covered in the above studies.

Lastly, regarding the relationship between clinicians and accountants, the literature confirmed the importance of involving clinicians in the management process and their collaborating with accounting practitioners to achieve successful public sector reforms in HCOs (Begkos et al., 2019). Furthermore, previous studies have referred to the debate about competition between clinical logic and economic logic (Oppi & Vagnoni, 2020; Rautiainen et al., 2021; Reay & Hinings, 2009). So, with regard to the competitive relationship between clinicians and accountants, the role of ERP technology is not considered in terms of either aggravating or solving the tension between the two logics (clinical and accounting) in the abovementioned studies. This thesis aims to fill this gap in the literature. More information of this relationship will be presented in the literature review section (Chapter 2).

1.3.2. Research objectives

According to the literature gaps articulated above, and their inadequate findings, the first research question explored in this thesis is as follows:

RQ1: What is the impact of ERP in the healthcare sector from the perspectives of clinical and accounting professionals?

The objective above aims to explore how both clinical and accounting actors respond to ERP as an institutional change when practicing MAPs, such as planning, decision-making process, control, and accountability. So, it will draw a comparison between the two groups about how ERP attributes facilitate or challenge those actors to participate in MAPs. The research will concentrate more on budgeting as a control mechanism since it is the most important in public sector (Rana & Hoque, 2020).

Also, it will focus more on accountability , adding to the literature and extending the findings of prior studies (Carlsson-Wall et al., 2021; Macinati et al., 2021; Rana & Hoque, 2020; Stewart, 1984; Vosselman, 2016). This research will investigate how ERP stimulates accountability, and how it helps or hinders the actors in meeting their accountability and producing the desired behavior, when referring to instrumental and social accountability. Also, when exploring the clinicians' accountability in particular, it will consider the occupational and organizational professions defined by Evetts (2010). More information about types of accountability and professions will be elaborated on in the theory and discussion sections (Chapter 3 and 6).

In addition, this thesis aims to examine the relationship between clinicians and accountants, given the existence of ERP logic, highlighting the role of such technology in either sparking or mitigating the debate between the two groups in the context of MAPs. Therefore, the second research question of this study is:

RQ2: How does ERP-practicing MAPs accordingly affect the relationship between clinical and accounting professionals?

Upon the results of the first objective, this thesis will highlight the alignments and misalignments between each group and ERP. Those findings will demonstrate the areas of ERP that both facilitate or complicate the work between these competing professions.

1.4. Research contribution

This thesis is the first of its kind, exploring the effect of ERP on MAPs in public healthcare in Qatar. Therefore, it will contribute to both literature and practice. Regarding the literature, firstly it will contribute to the existing knowledge of NPM, providing insights from Qatar, given that the literature is rich with studies from developed countries about healthcare reformation while there is a scarcity of results

from developing countries about reforming the public sector in general and healthcare in particular, Qatar being overlooked. This study will outline the effort that Qatar has invested into enhancing and developing healthcare, especially in terms of technology use. Secondly, it refers to the impact of ERP on the clinicians' and accountants' roles, contributing to healthcare studies and information systems, as it re-evaluates ERP technology from a new perspective. Thirdly, it will contribute to management accounting research in the healthcare field since the implementation of MAPs differ from one case to another. This thesis aims to explore the relationship between clinicians and accountants practicing MAPs, in light of ERP technology, an issue that has not been investigated in the literature. Fourthly, the research will adopt a qualitative method and a single case study that will enrich the qualitative research in both healthcare and management accounting area.

Regarding its contribution to practice, it might be in the interest of the healthcare policy makers and ERP providers since it will delineate the actors' alignment and misalignment with ERP. Hence, it will highlight the areas that need improvements to enhance the interplay between the actors (clinicians and accountants) and ERP and a better way of using such technology. Also, it might be in the interest of private hospitals who have not adopted such a technology yet.

1.5. Structure of the thesis

This thesis consists of seven chapters. Chapter 2 contains a literature review, defining and reviewing relevant prior studies about the key concepts that are NPM, ERP, and accounting in HCOs. It will also delineate the differences between clinicians' and accountants' logics and discuss their relationship. This is followed by Chapter 3, which discusses the theoretical framework that will elaborate the findings. Chapter 4 presents the research method, research context, the method of data

collection, the sample of research subjects, and the data analysis. Chapter 5 discusses the interview findings in detail. This is followed by further discussion in Chapter 6, articulating the results using the theoretical framework presented in Chapter 3. Finally, Chapter 7 gives a conclusion of the study, including the research contributions, limitations, and suggestions for future studies.

Chapter 2: Literature Review

2.1. Overview

This chapter is devoted to a literature review, which presents the relevant studies and findings that led to the identification of the research gap and the creation of the research questions. It is divided into three main sections. Section 1 introduces the concept of NPM and reviews studies conducted in both developed and developing countries. Section 2 defines ERP, discusses its impact on management accounting, and provides a brief introduction to information systems in the healthcare sector, followed by the implementation challenges and benefits in healthcare organizations (HCOs). It ends with a review of previous studies on ERP in Arab countries' public sectors. Section 3 reviews the nature of accounting in HCOs and highlights the differences between the two professions in healthcare, clinical and accounting. This is followed by a discussion on the relationship between these professions, which elucidates the challenges of such relationships and reviews ways to mitigate them. The chapter ends with an overall summary.

2.2. NPM

This section defines the NPM process and highlights the research gap within developing countries' public sector.

2.2.1. Definition and principles of NPM

The concept of NPM was introduced by scholars such as Christopher Hood in recent decades to refer to public sector reform. It emerged in the 1980s in Western countries and was supported by various international organizations, such as the Organization for Economic Co-operation and Development (Fredriksson & Pallas, 2018). NPM is a set of approaches, methods, and ideas that aim to reform governmental entities and services so that they emulate private sector practices (Al Otaibi, 2015;

Fernandez et al., 2017).

According to Hood (1995), there are seven principles when it comes to reforming public organizations: professional management, performance measurements, decentralization, competition within the public sector, adoption of private sector practices, output control, and efficiency. In addition, the literature emphasized that NPM intends to make public organizations more business-like, which refers to maintaining their *identity* (more accountability and responsibility toward the results), *rationality* (what goals have been achieved and how), and *hierarchy* (changes in organizing, managing, performing, and evaluating the work) (Fredriksson & Pallas, 2018). Furthermore, NPM theory looks at governmental entities from the lens of managerialism and productivity (Al Otaibi, 2015), both of which aim to achieve higher levels of performance (Fredriksson & Pallas, 2018).

2.2.2. NPM in developing/Arab countries

The literature was rich with studies on NPM in developed countries. For instance, Rana et al. (2019) investigated performance measurement and risk management practices in the Australian public sector. Additionally, Speklé and Verbeeten (2014) examined the impact of performance measurement systems on performance levels in the Dutch public sector. The literature also presented studies on NPM in developing countries. For example, Rozai (2016) investigated the transition process of NPM in the Malaysian public sector, highlighting the various new principles implemented, such as performance measurement systems, quality management, and reforms in accounting practices (e.g., International Public Sector Accounting Standards). Moreover, various studies have been conducted on NPM in African countries, such as Wanyonyi's (2019) investigation into the impact of NPM in Kenya and the factors that affected its implementation, such as limited resources, given that reformation processes are highly

expensive. Wanyonyi's (2019) study also highlighted the drivers of NPM in Kenya, such as obtaining a good reputation to attract international donors.

However, there is limited research on public sector reform in Arab countries in general and in Gulf Cooperation Council (GCC) countries in particular. In Helden et al.'s (2021) recent literature review on public sector accounting research in developing countries, they found that most studies were conducted on African countries, with the majority focused on Tanzania and one on Morocco. Moreover, they only found one study on GCC countries, which was conducted by Hassan and Mouakket (2018) in the United Arab Emirates (UAE). In addition, Al Otaibi (2015) presented a general overview of the efforts undertaken in Saudi Arabia (KSA) to reform its governmental entities. Still, evidence from Arab countries' public sectors in terms of reformation remains scarce, in particular reforms that emerged due to both internal and external factors and pressures (Rozai, 2016). To illustrate, studies on reformation in Africa's emerging countries, such as Wanyonyi's (2019) study, have revealed different motives or pressures (aiming to attract donors) than those uncovered by Al Otaibi's (2015) study on Saudi Arabia, where the reforms were designed to improve the public sector's performance and services for the public. Therefore, this study aims to present findings from the public sectors of Arab/GCC countries given their specificity, distinct environments, and different drivers for reform.

Regarding public healthcare sector reform, the literature was rich with studies conducted on developed countries. For instance, Carlström (2012) investigated the roles and strategies of middle managers in Swedish hospitals in response to accounting reforms. Carr and Beck (2020) explored clinicians' responses to the managerial controls implemented in Ireland during the financial crisis, which led to a reduction in hospitals' funding. Furthermore, Conrad and Uslu (2011) reported the impact of control

mechanisms on the performance and management of the healthcare sector in England, which positively affected patients despite the resulting financial pressure. Macinati et al. (2021) explored the relationship between the formal and informal sources of accountability and the performance of clinical managers in Italy. In addition, Kurunmaki et al. (2003) presented a comparative study on the UK and Finland, examining the usage of accounting information, such as costs and budgets, in medical decision-making processes.

The literature also presented studies from developing countries. For example, Cui et al. (2019) investigated the healthcare reforms in Chinese hospitals in response to the financial crisis by examining the role of developing costing systems. Chol et al. (2018) reviewed the reforms implemented in sub-Saharan African countries' healthcare sectors, which were harmed due the wars that occurred there. Additionally, Alami (2017) reported the financing initiatives in the health services and insurance systems in several Arab countries—such as Egypt, Jordan, Iraq, and Algeria—to ensure their populations can access healthcare services. However, the study of Alami neither included GCC countries nor focused on the public sector or efforts undertaken to improve the healthcare systems in these countries. Thus, there is a lack of studies on public healthcare reform in Arab countries, particularly on accounting reform.

2.3. ERP

As previously mentioned, in the 1980s, jurisdictions around the world began to adapt the NPM model by implementing several processes, such as accrual-based accounting and performance-based budgeting, and strengthening accountability and transparency principles (Wanyonyi, 2019). Additionally, automating systems using ERP was one of the reformations and transformations adopted by public entities (Fernandez et al., 2018).

2.3.1. Definition and characteristics of ERP

ERP was developed after the innovations undertaken in a series of information system products, which began in the 1970s with the purpose of optimizing the use of inventory in the manufacturing industry (Umble et al., 2003). The development of inventory systems began with the introduction of Materials Requirement Planning (MRP)-I to ensure just-in-time inventory (Ganesh et al., 2014) and maintain competitiveness (Umble et al., 2003). The software was improved in the 1980s with the development of MRP-II, which integrated additional processes, such as financial planning (Ganesh et al., 2014). Finally, the technology was extended to the point where ERP was created in the 1990s. ERP addresses the shortages of previous products by solving the issue of fragmentation in large entities (Umble et al., 2003). It encompasses the seamless integration of business processes across different departments, such as financial data, human resources (HR), the supply chain, and customer information (Davenport, 1998). Therefore, ERP enhances collaboration through the integration and automation of such processes, speeding up transactions and fostering transparency (Ganesh et al., 2014). Furthermore, according to Umble et al. (2003), there are two fundamental advantages to ERP: (1) it is a single database where all enterprise data is recorded, processed, and monitored, providing (2) a unified, holistic overview for the enterprise. In other words, ERP is defined by Davenport (1998, p.121) as "putting the enterprise into the enterprise system"

Furthermore, ERP has additional advantages that make it attractive for other industries and not only manufacturing. It can be integrated with other software applications (James, 2020), which enables the cross-functional sharing of reliable data throughout an organization. Therefore, it improves communication and serves both internal and external stakeholders (Ganesh et al., 2014). Additionally, as it is

characterized by standardization, it streamlines enterprises, unifying the data format through a relational database and systemizing communication (Chtioui, 2009). Moreover, ERP has the benefit of adding data analytics features, which retrieves data from a central location, then programs and converts it into meaningful reports, allowing users to make functional decisions. This descriptive and predictive analysis of the data provides useful conclusions that highlight the probable risks and opportunities for the organization (Babu & Sastry, 2014).

There are two types of ERP; it began with on-premise ERP, which was hosted internally by organizations. The late 2000s saw the emergence of cloud-based ERP, which improved the product by introducing mobility to the software (Peng & Gala, 2014). Cloud-based ERP uses cloud computing technology, which is defined as the on-demand provision of data and computer resources anywhere and at any time (Kumar et al., 2019). As ERP turned to cloud computing technology, the software became more flexible as location barriers were removed, allowing users to access data and make decisions remotely, which increased businesses' productivity (Scholtz & Atukwase, 2016).

2.3.2. Impact of ERP on management accounting practices (MAPs)

The Chartered Institute of Management Accountants (2017, p.48), defined management accounting as "the sourcing, analysis, communication, and use of decision-relevant financial and non-financial information to generate and preserve value for organizations." Furthermore, the Institute of Management Accountants (as cited in Lawson, n.d., p.1) defined the management accountant profession as a "profession that involves partnering in management decision making, devising planning and performance-management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of

an organization's strategy." Thus, in contrast to financial accounting, which produces information with the purpose of satisfying external stakeholders' needs, the aim of management accounting is to provide information to be used internally (Gabriela et al., 2014).

Economic globalization removed location barriers and created opportunities for firms, increasing their productivity and investments. Large volumes of operations and transactions means more complexity, which leads to a huge amount of data to be processed, overstretching human intellect. Thus, information technology (IT) solutions became imperative to keep pace with this expansion. The purpose of management accounting is to process data and reporting for internal users to facilitate decision-making processes, which creates value for a firm, helps it achieve its strategic objectives and highlights opportunities for development. The literature presented several studies that have investigated both how ERP influences management accounting and whether it has changed the role of management accountants. Some of these studies and their results will be discussed briefly below.

Pervan and Dropulić (2019) explored the impact of integrated information systems, including ERP and other specialized applications, in Croatian firms. Their study confirmed that multidimensional databases and the broadest use of modules provide the best opportunity to collect the largest volume of accurate and timely data, generating a larger number of reports. They added that the analytical capabilities of these systems reflected positively on various management accounting techniques, such as budgeting, forecasting, key financial and non-financial indicators, and activity-based costing (ABC). Similarly, Vakilifard et al. (2013) indicated that ERP's provision of real-time and accurate data enhances the quality and validity of reports; however, they argued that is an indirect effect. Some researchers have extended this element of the

literature, contributing similar arguments. For instance, Ammar (2017) examined the interplay between enterprise systems and MAPs, considering the role of business process management (BPM) as a significant factor in this association. Ammar's (2017) study emphasized the significant role of BPM in overcoming the misalignment between existing and preconfigured processes. He also confirmed the functionality of intelligent systems, which, in addition to ERP features, lead to analytical and strategic decision-making processes, such as in understanding customer behavior. Furthermore, studies conducted by Spraakman et al. in 2015 and 2018 documented the important knowledge and skills that management accountants should have for the functional employment of ERP in MAPs.

Moreover, ERP strengthens control systems since it provides detailed and accurate information of a firm's operations at the activity level. For instance, Jacking and Spraakman (2006) asserted that ERP's capability of connecting accounting with operating systems facilitates following up projects via the data provided on the activities performed. They confirmed that with previous legacy systems, management was not able to link budgeted plans with the actual activities performed, which hampered its ability to track the real performance and predict the outcomes. Likewise, Seethamraju (2015) emphasized that the comprehensive overview provided by ERP via cost and revenue modules is both functional for control systems and supportive for a wide range of MAPs.

In addition, previous studies have referred to the functionality of ERP in performance measurement (Jacking & Spraakman, 2006; Sánchez-Rodríguez & Spraakman, 2012; Spraakman et al., 2018). As ERP became more comprehensive, thorough, and standardized, it systemized the flow of transactions throughout an organization and enhanced the chart of accounts (Sánchez-Rodríguez & Spraakman,

2012). Hence, it improved operating statements by producing more detailed, accurate, integrated, and real-time data (Jacking & Spraakman, 2006). Furthermore, ERP computerization evolved to include the usage of management support applications, such as ABC, and provide more accurate and rigorous data analysis (Scapens & Jazayeri, 2003). Similarly, forecasting became more advanced and practical as budgeting spreadsheets became both integrative and interactive within ERP through supporting BPM systems, such as Hyperion. In this regard, Jacking and Spraakman (2006), confirmed that ERP contributes to performance measurement as it enables the development of a feedback system on the budgeting process. To clarify, they documented that the availability of real-time data based on activity levels allows controllers to assess the capital project throughout the entire process to ensure project efficiency. Additionally, it enables post-project auditing to evaluate the successfulness of the project. Therefore, these advancements are reflected in performance measurements; the characteristics of ERP triggered more detailed and timely information on transactions, considering additional units and products, which led to more standardized, detailed, accurate, and timely measures (Sánchez-Rodríguez & Spraakman, 2012).

Moreover, Jacking and Spraakman (2006) argued that ERP enables a broader understanding of a firm's operations, which has positively reflected on performance measurements. Sánchez-Rodríguez and Spraakman (2012) added that ERP encourages and facilitates the use of non-financial information, which can be used to create key performance indicators (KPIs). Other studies also have pointed to the role of ERP in connecting financial and non-financial information. According to Spraakman et al. (2015) and Spraakman et al. (2018), ERP helps management accountants to drill down into financial data and extract the drivers that will achieve the KPIs. They asserted that

such analysis allows management accountants to find a rational link between financial performance and physical activities, which in turn advances the decision-making process.

Regarding the effect of ERP on the role of management accountants, previous studies have confirmed that the implementation of ERP eliminates the time spent on routine work and shrinks accounting operations (Jacking & Spraakman, 2006; Scapens & Jazayeri, 2003), allowing more time to be devoted to analysis, performance evaluation, and adding value to the organization (Vakilifard et al., 2013). In other words, ERP extended the role of management accountants to include analysis, rather than simply producing financial figures (Gabriela et al., 2014). Additionally, Scapens and Jazayeri (2003) confirmed that as ERP automates the generation of entries, it reduces the need for accounting staff, e.g., cost clerks. Thus, while ERP may threaten accountants' jobs, it could also provide them with an opportunity to expand their role and engage in management activities.

Furthermore, Vakilifard et al. (2013) suggested that ERP saves approximately half of management accountants' time, which can then be spent on non-accounting activities, such as personnel education and strategic activities. In addition, the availability of ERP relieves management accountants from certain tasks—such as justifying variances and tracking budgets and forecasting—since it enables line managers to also become knowledgeable in accounting (Scapens & Jazayeri, 2003). In contrast, Carlsson-Wall et al. (2021) investigated cloud-based ERP in a Swedish municipality and found that such a system contributed more to the fulfillment of government requests than to the organization itself. In other words, it supported a functional management accountant role more than an advisory role.

In addition, the literature emphasized that management accountants currently

have multiple roles that require technical skills to effectively influence and contribute to the management process (Rouwelaar et al., 2021). In particular, the adoption of ERP encourages accountants to improve a variety of skills to be able to keep up with this technology; controllers must improve their IT, teamwork, and communication skills, as well as their cross-functional knowledge (Pervan & Dropulić, 2019; Vakilifard et al., 2013). Thus, they will be compatible with the rationale of ERP, which is based on the principles of integration and seamless connection to reinforce collective work across an organization. Additionally, Seethamraju (2015) documented that as technology is upgraded, management accountants will require training and education to improve their capabilities and make the most of the resulting opportunities. Seethamraju's (2015) study confirmed that failing to provide such training leads management accountants to work around the technology rather than take advantage of it. Therefore, the literature placed an emphasis on the education of management accountant graduates, given the IT knowledge and skills that are required for data analysis when using ERP or any other supporting system (Spraakman et al., 2015; Spraakman et al., 2018).

2.3.3. The effect of adopting ERP on healthcare

This section will provide a brief introduction to information systems in HCOs. Then, it will focus on the impact of adopting ERP in hospitals. It will review the challenges discussed in previous studies, as well as the benefits to patient care and administrative procedures.

Hospitals have a single function that involves diverse competencies with different knowledge bases and various professional and managerial interests and cultures (Begkos et al., 2019). As part of managerial reforms in the healthcare sector, HCOs are required to adopt an integrated information system that facilitates the exchange of information between multiple stakeholders. Generally, integrated information systems

in HCOs streamline healthcare services—ensuring the continuity of services and reducing the risk of fragmentation—as they enable the exchange of data between various functions (McNamara, 2000). They provide accessible, centralized information, which improves the efficiency and effectiveness of care services, enhancing care management and quality.

Integrated information systems comply with the regulations and acts related to HCOs, such as the Health Insurance Portability and Accountability Act (Schiller, 2017), which aims to protect the privacy and security of electronic health records (EHRs). Similarly, in contrast to using isolated data systems, implementing integrated information systems at the state level fulfills the dimensions of the Triple Aim (Miranda et al., 2013). The Triple Aim is a framework established by the Institute for Healthcare Improvement (IHI) and is widely used as the foundation of HCOs to enhance population health (Hamad Medical Corporation [HMC], 2017). The framework suggests that there are three dimensions that should be achieved to improve the performance of healthcare systems: improved patient care, reduced costs, and improved population health (IHI, n.d.).

According to Begkos et al. (2019), accounting in the healthcare sector is a strategizing process that encompasses both human and non-human actors. Non-human actors include the accounting tools, practices, and systems that enable accountants to cope with dilemmas. In this respect, previous studies have discussed the benefits of integrated information systems for HCOs. Schiller (2017) proposed that integrating supply chain management based on an integrated information system provides the best opportunity to reduce costs by managing and forecasting inventory. He also found that the application of an integrated system reduced the inventory of medical and surgical supplies by 50%. Similarly, Carroll (2005) asserted that integrated information systems

help HCOs to integrate their inventory management systems, which eases the tracking of inventory levels and enables automatic restocking as required.

The following subsections below review the prior research on the challenges and benefits of ERP in HCOs.

2.3.3.1. Challenges of ERP in HCOs

Regarding ERP as an integrated information system, it was originally created primarily for the manufacturing industry to enable the optimal use of inventory after a series of innovations to previous systems. Following this, it became attractive to other sectors, and ERP providers developed specialized products with customization and configuration options to ensure the software fit with different entities' requirements. However, the healthcare sector is characterized by complexity. This was confirmed by Khoumbati et al. (2006), who found that information systems in HCOs are self-ruling and diversified. Similarly, Jenkins and Christenson (2001) emphasized that the adoption of an ERP system must consider the network of relationships in HCOs, which comprise various parties, such as patients, physicians, laboratories, and government agencies. Thus, due to the distinguished character of the healthcare sector, it needs a highly customized product. Although ERP vendors now provide specialized products, HCOs differ in specializations and organization size.

Other studies have also emphasized the challenges of ERP in HCOs. Bazhair and Sandhu (2015) argued that the sensitivity and identity of the healthcare sector, which prioritizes patients' lives, increase the complexity of ERP implementation. This indicates that monitoring costs and consumption—something which ERP enables—may conflict with the main objective in healthcare, which is patient outcomes. In addition, Abukhader (2015) found that, due to several factors, implementing ERP in HCOs takes longer. These factors include the size of an organization and user

acceptance, in particular medical professionals. Similarly, Mucheleka and Halonen (2015) asserted that, despite its successful implementation in the healthcare sector, it is conceivable that user resistance to ERP will still be encountered, as it takes time to become familiar with such an organizational change. Furthermore, ERP implementation is costly, especially in healthcare since it requires additional costs as discussed above, such as customization and integration testing (Mucheleka & Halonen, 2015). The implementation of integrated information systems in healthcare is more sophisticated given that it involves integration with medical devices and equipment to take advantage of the integration and intelligence such systems provide.

Despite the above challenges, the literature showed that the successful implementation of ERP in the healthcare sector is similar to that in other industries and depends on various factors, such as the effective management of change, top management support, project management, and the implementation team (Fiaz et al., 2018). Furthermore, prior studies have highlighted the benefits of using ERP in HCOs and have encouraged users to adopt it due to its utility (Escobar-Rodríguez & Bartual-Sopena, 2015). The literature emphasized that the benefits of ERP in the healthcare sector prevail throughout various functions and areas. In this regard, Chiarini et al. (2018) explored ERP in healthcare, categorizing the benefits into four groups: patients, stakeholders, strategic management, and operations. Similarly, other studies have confirmed that ERP supports both clinical and administrative functions and processes (Parr & Shanks, 2000; Stefanou & Revanoglou, 2006). These benefits will be discussed below.

2.3.3.2. Clinical benefits

The healthcare sector is a service industry that relies on information to deliver its services. Accordingly, the literature emphasized the importance of the availability and

accessibility of information in HCOs (Huq et al., 2006), which corresponds to some of the advantages of ERP. Regarding patient care, prior studies have highlighted the utility of the accessible and automated information provided by ERP in enhancing the quality of care services (Fiaz et al., 2018; Khoumbati et al., 2006; Parr & Shanks, 2000). Care services are an outcome of the collaboration of many physicians and clinicians, all of whom require access to information on patients (Shnayder et al., 2005). The literature emphasized the importance of data availability for HCOs through integration, since a lack of integration both negatively affects core healthcare processes and delays patient care services (Schiller, 2017). Naqi et al. (2021) stated that an integrated information system enables physicians to access patients' records as needed regardless of time and place through a central database. Thus, it enhances treatment plans and referral decisions (McNamara, 2000). In other words, an integrated information system facilitates the tracking of patients' medical records, meaning that care providers can find better ways to treat their patients (Institutional Investor Systems, 1996). Therefore, a single database, such as that used in ERP, makes the data accessible from different sites, enhancing service quality and efficiency (Escobar-Rodríguez & Bartual-Sopena, 2015; Fiaz et al., 2018). Accordingly, it strengthens the relationship between the patient and the physician, bringing transparency to the service and enhancing trust (Naqi et al., 2021).

ERP has the advantage of ensuring information and system quality as it guarantees the accuracy of the data, the consistency and completeness of documentation, and the reliability and quality of the reports generated. Additionally, it is easy to use and access (Fiaz et al., 2018). Thus, it has a positive impact on users in HCOs as it increases their awareness via the data related to their specific responsibilities (Ilyas et al., 2016). According to Panasiuk and Kowalczyk's (2021) study, the quality

of the data provided by ERP increases the efficiency and functionality of clinical units. Furthermore, Fiaz et al. (2018) confirmed that ERP increases users' awareness, which increases medical professions' productivity and enhances the effectiveness of decision-making processes.

Naqi et al. (2021) indicated that the value of implementing ERP into the healthcare sector comes from its ability to be integrated with other applications and machines. Naqi et al.'s study (2021) reviewed some innovations that could be amalgamated with ERP, such as telemedicine, which is the use of technology that enables remote communication, examination, consultation, and diagnosis.

The availability of reliable information assists physicians in making precise diagnoses (Adler-Milstein & Bates, 2010). Therefore, it reduces medical error (Rosenbloom et al., 2007) and is helpful in the identification of medical errors should they occur (Bates et al., 2003). Additionally, an integrated information system incorporates and standardizes all core processes and key functions, affording a precise and valid delivery schedule for related services (Schiller, 2017). Accordingly, it streamlines and controls core processes to enhance patient safety by providing protection from medication errors and reducing the fragmentation of services. Furthermore, Naqi et al. (2021) added that the ability of integrating artificial intelligence with ERP ensures the accuracy of diagnoses and could detect certain relevant information as it provides clinicians with analyzed images and text. Thus, the existence of integrated information systems at an HCO affects the entire organization, supporting medical professionals in focusing on clinical outcomes (Institutional Investor Systems, 1996).

Concerning the security and privacy of data, Elmuti and Topaloglu (2013) emphasized that ERP programmers have invested large amounts of time in achieving a

reasonable and robust level of security and protecting the system from unauthorized access. Moreover, the data can be protected via robust access controls, authentication, and encryption (McNamara, 2000). Similarly, Ghazvini and Shukur (2013) reported that auditing is necessary to protect healthcare systems, since they hold a valuable asset in patient records. Therefore, as Fiaz et al. (2018) stated, the quality of the system—which encompasses the technical aspects and protects it from bugs—will improve the quality of the healthcare service. Thus, there is an indirect relationship between ERP and the quality of healthcare services.

2.3.3.3. Administrative benefits

ERP improves information quality, integrity, reliability, and timeliness, enhancing communication between the multiple stakeholders within a hospital (Khoumbati et al., 2006; Stefanou & Revanoglou, 2006). Thus, regarding administrative and financial functions, prior studies have confirmed that the organizational impact of ERP in healthcare includes increased effectiveness, efficiency, productivity, competitive edge, and accountability. For instance, Ilyas et al. (2016) asserted that successful implementation of ERP in HCOs leads to improved cost effectiveness as it reduces the costs of staff, inventory carrying, and other administrative processes. According to Fiaz et al. (2018), ERP is useful in cost planning and material management. Additionally, an integrated information system reduces duplication, saving time and effort (McNamara, 2000).

ERP increases the productivity of an organization (Naqi et al., 2021) as it increases its capacity, which allows a larger volume of transactions. This was emphasized by Fiaz et al.'s (2018) study, which found a positive association between ERP in HCOs and both competitive advantage and market and strategic value. Moreover, it has a favorable impact on control and accountability. ERP promotes

transparency (Mucheleka & Halonen, 2015), which in turn promotes accurate billing processes (Stefanou & Revanoglou, 2006), reducing corruption (Fiaz et al., 2018).

Regarding extra-organizational relationships, ERP is capable of integrating all related stakeholders. For instance, it enhances the transactions between an entity and its suppliers as it keeps records and can automate the process for future purchases (Naqi et al., 2021). Furthermore, it facilitates report generation, providing accurate and real-time information (Stefanou & Revanoglou, 2006). In this respect, in the case of the public sector, it supports various NPM principles—such as monitoring, performance measurement, and benchmarking—since it can be integrated with higher authorities within a jurisdiction.

2.3.4. ERP in developing/Arab countries

This section discusses previous ERP research conducted in a number of developing countries and its findings regarding the public sector. For instance, Fernandez et al. (2017) explored the impact of ERP systems in the Malaysian public sector, considering two elements of the balanced scorecard: financial performance and client satisfaction. Fernandez et al. (2018) then extended their previous research to investigate the challenges of the optimal implementation of ERP in public sector organizations. Both of the aforementioned studies involved distributing questionnaires among a random sample of public organizations with no reference to the type of the specialist service provided. Furthermore, Scholtz et al. (2016) investigated the factors that hindered the implementation of cloud-based ERP in the South African public sector, considering both technical and environmental aspects. Their study highlighted two main technical factors, data privacy and availability, that may have affected its adoption due to the related confidentiality concerns. Gabryelczyk and Roztocki (2017) examined the relationship between BPM and ERP adoption in Poland.

Referring to the previous section on NPM and considering ERP as a tool for reforming the public sector, this research aimed to narrow the research area within Arab/GCC countries to fill the gap in the knowledge. A number of studies from Egypt, Bahrain, KSA, the UAE, and Kuwait will be discussed briefly to highlight this gap.

Hassan and Mouakket (2018) explored the interaction between ERP systems and a public service organization for accountants in the UAE. This study revealed that accounting-based ERP gave rise to mistrust between the accountants and the organization's top management regarding the motives behind the implementation due to the accountants' lack of technical knowledge, which led to a work-around of the systems. These results are consistent with other studies that have confirmed the importance of accountants having IT knowledge and skills (Pervan & Dropulić, 2019; Spraakman et al., 2015, 2018). Alsharari (2021) also conducted a case study on a public sector organization providing IT services in the UAE, highlighting the incentives behind its transition to cloud-based ERP, as well as the outcomes related to performance and productivity. Albataineh (2013) reported on ERP in a Kuwaiti oil and gas company, considering the role of ERP implementation methodologies to obviate the risks of such a company. Bukamal and Abu Wadi (2016) studied the successful factors in the implementation of ERP in the public sector in Bahrain; however, they gave no indication of the type of organizational activity they studied. Similarly, Al-Harthi and Saudagar (2020) conducted a case study in KSA to understand the drivers of successful ERP implementation in the Ministry of Education. Furthermore, with regard to integrated information systems in general, one study was conducted in Qatar by Al-Shafi and Weerakkody (2010), which revealed citizens' perspectives on the adoption of e-government services.

Based on the discussion in the section on NPM, this study attempted to fill the

gap regarding the limited information currently available on public healthcare sector reform in Arab countries. Considering ERP as a mechanism for reform, especially in healthcare, few studies were found on ERP implementation in hospitals in Arab countries. For instance, Fares and Mandour (2014) investigated the drivers and impact of ERP implementation in a hospital in Egypt. However, their work did not indicate whether it belonged to the public or private sector. Another study by Abukhader (2015) presented findings from KSA, exploring the degree of success of ERP implementation in private hospitals. Furthermore, Almajali et al. (2016) investigated the factors behind successful ERP implementation, focusing on small-to-medium size healthcare entities in Jordan.

The above studies highlight the lack of research into ERP systems from the perspective of Arab countries' public healthcare services. The section on management accounting highlighted how the majority of studies have been conducted on the private sector, while there has been a limited number of studies on the effect of ERP on management accounting in public healthcare services. Therefore, this research aimed to fill this gap and contribute to the knowledge by investigating the impact of ERP systems on HCOs, in both the clinical and accounting professions.

2.4. Accounting in the healthcare sector

This section discusses the nature of accounting in HCOs and presents the differences between the two main logics in healthcare. It also reviews previous studies that have been conducted on the relationship between accountants and clinicians, highlighting the collaboration constraints and mechanisms in such a relationship.

HCOs are uncertain and unpredictable environments (Kurunmaki et al., 2003; Lapsley, 2001), making it difficult to match input with output in terms of medical processes and procedures. In this regard, Schiller (2017) argued that the dilemma in

managing costs in HCOs comes from their inability to determine accurate costs for specific care services. This is consistent with Jenkins and Christenson (2001), who highlighted that the difficulties in managing resource use in hospitals arise as clinical procedures differ from physician to physician and cases vary from patient to patient. Furthermore, Begkos et al. (2019) argued that accounting is not the output of a stable strategy decided in a boardroom; instead, it is a strategizing process. This is especially true in HCOs, where multiple stakeholders and interests increase uncertainty, making accounting a vital component in strategizing and providing coping mechanisms to respond to unexpected events.

The healthcare sector has experienced changes due to the managerial and accounting reforms implemented to comply with NPM principles (Hood, 1995). As a result of these reforms, accounting has been placed at the center of efforts employed to enhance service quality and efficiency in HCOs (Pflueger, 2015). Particularly, management accounting in the public healthcare sector has been oriented toward the implementation of managerial controls and mechanisms. These include budgeting, forecasting, and compensation systems (Nyland et al., 2017), as well as performance measurement, efficiency and effectiveness, and benchmarking (Oppi & Vagnoni, 2020).

In addition, the reforms have led to both centralization and coercive regulations, which have increased the pressure and workload on those working in HCOs. The literature emphasized the role of management accountants in the implementation of managerial mechanisms (Carlsson-Wall et al., 2021). The principles of NPM encourage management accountants to have more of a business partner role rather than just performing a functional one (Paulsson, 2012). In other words, the process tends to push the role of management accountants toward contributing to management processes and

participating in decision-making processes rather than simply producing financial information. However, HCOs include a large number of stakeholders, which leads to pressure being placed on management accountants from many parties, both inside and outside the organization. In this regard, Oppi and Vagnoni (2020) found that management accountants are unable to perform a dual role and that they still focus on a functional role to fulfill regulatory requests. This study revealed that accounting information systems satisfy the needs of extra-organizational stakeholders, resulting in role ambiguity and harming the accountants' relationship with clinical managers.

2.4.1. The difference between clinical and accounting logic

As previously mentioned, hospital environments comprise stakeholders who are diverse in their knowledge and backgrounds; accordingly, their goals are varied and may clash at times. Referring to clinical and accounting parties in particular, they are conflicted in their values, norms, measures, and objectives. Accounting logic is related to enterprise logic and consequentiality, which is premised on budgeted plans, evaluation, and reporting (Pettersen & Solstad, 2014). Thus, their work is concerned with evaluating every single activity and measuring the outcomes and value added from utilizing or receiving resources (Silva et al., 2013). In contrast, clinical logic is related to professional norms, values, knowledge, and ethics that conflict with economic logic (Pettersen & Solstad, 2014). In other words, clinical logic prioritizes patients' health and life over financial and other measurable outputs.

Previously, the traditional approach taken in medicine depended on the autonomy of doctors, self-regulation, and the power of their licenses (Silva et al., 2013). However, the healthcare sector has been subjected to various reforms since the emergence of the NPM model. However, the principles of NPM have placed increased stress on clinical managers and have caused them to get lost among clinical demands, reducing costs,

and improving quality, all of which threatens their decision-making autonomy (Fallman et al., 2019). Thus, political and economic pressures, coercive regulations, and control have combined to threaten the core logic of medicine (Silva et al., 2013). In other words, the enterprise logic of accounting relies on historical data, forecasting, and preparing a budgeted plan for actions, which does not suit the dynamism and diversity of healthcare services as they are related to patients' lives and health. Therefore, compliance with accounting information in clinics is generally moderate given that accounting control relies on plans that precede actions, which is in conflict with clinical practices, increasing the probability of deviation at times (Pettersen & Solstad, 2014). In other words, clinical procedures are mostly unpredictable and unmeasurable since they depend on a patient's condition, while accounting activities are related to measurable inputs compared with outputs.

The following section reviews the previous studies that have presented considerable findings on the relationship between these two logics in light of NPM. In addition, it presents the constraints on such a relationship and provides suggestions based on previous studies to enhance collaboration.

2.4.2. Clinician and accountant relationships

In the context of healthcare management, it has been suggested that effective collaboration between clinicians and financial leaders is crucial to success in HCOs, which is measured based on the Triple Aim standards (Schiller, 2017). The accounting literature also emphasized the importance of clinicians and accountants to both the successful management of the healthcare sector and the implementation of NPM principles. Healthcare reforms have reshaped the roles of both clinicians and management accountants (Oppi et al., 2019). Clearly, management accountants have been encouraged to employ accounting information in managerial mechanisms—such

as performance measurement and benchmarking (Conrad & Uslu, 2011)—while clinicians have been pushed toward participating in the management process (Carlström, 2012; Jacobs, 2005; Kurunmaki et al., 2003; Llewellyn, 2001; Oppi & Vagnoni, 2020).

Carr and Beck (2020) argued that the success of management control is affected by the relationship between clinicians and management. At the same time, prior studies have pointed out the contestation between medical logic (which involves clinicians' objectives) and economic logic (which involves the objectives of top management) (Campanale & Cinquini, 2016; Nyland et al., 2017; Pflueger, 2015). According to one critique, it is assumed that managerial controls should be imposed on employees to avoid resistance and achieve organizational goals (Llewellyn, 2001). In contrast, Carr and Beck (2020) suggested that imposing such control mechanisms does not effectively guide clinicians; instead, it negatively impacts their commitment to patient care due to the complexity and sensitivity of healthcare. The following subsections below review the literature on the issues that spark or mitigate the contestation between clinicians and accountants.

2.4.2.1. Collaboration constraints

Previous studies have addressed several constraints that hinder collaboration between clinicians and accountants and increase the contestation between them. According to Carr and Beck (2020), most clinicians' views conflict with control objectives because they prioritize patient care over efficiency, meaning that they will fight to protect it from such a system. Thus, clinicians consider control tools and practices as a threat to their values (Lapsley, 2007; Nyland & Pettersen, 2004). Additionally, they perceive that certain accounting techniques, such as participating in budgets, are complicating their work, wasting their time, and interrupting patient care

(Rautiainen et al., 2021).

Other studies have referred to the issue of communication between the two groups. In the case study by Carr and Beck (2020), clinicians claimed that there is a lack of adequate discussion or communication with management unless they face a problem and that their recommendations and advice are often ignored. Hence, the literature emphasized the importance of considering medical perspectives in organizational changes (Reay & Hinings, 2009). In other words, to achieve success in a new system, whether policy- or technology-related, all users and participants in the organization should be involved in order to increase their awareness and responsibility and, consequently, their accountability toward the system (Begkos et al., 2019). Such involvement balances the power of decision making among medical and finance practitioners, helping to align management control with care delivery (Oppi et al., 2019).

Moreover, several studies have reported on the issue of dissatisfaction with information. In this regard, Carlström (2012) argued that accounting information systems in HCOs experience two problems based on the fact that they are designed (1) to meet national requirements and (2) for benchmarking. The consequent lack of relevant information leads to frustration for clinicians, weakening their involvement and initiative in management control processes (Carr & Beck, 2020). Similarly, Oppi and Vagnoni (2020) revealed the negative impacts of centralization and coercive regulations when accounting information systems are developed to meet extra-organizational requests instead of to contribute to the management process. Due to the lack of information provided, these processes have a negative effect on clinical managers' contributions to and involvement in management processes. Thus, accounting information systems should be what links clinicians with accountants.

Moreover, Carr and Beck (2020) revealed that clinicians are dissatisfied with management control information, such as budgetary considerations, because it is not directly related to their activity or specialism. Thus, the information provided to each unit or activity should fit the specific needs of the clinicians and be consistent with their considerations and perspectives.

Referring to the differences in background, Oppi and Vagnoni (2020) argued that information provided by management accountants challenges users with a medical background, affecting their satisfaction with whether the information meets their needs. In addition, Begkos et al. (2019) found that clinical directors are unaware of resource allocation and the financial consequences of their decisions. In other words, the medical education system does not support clinicians' involvement in managerial issues (Oppi et al., 2019).

2.4.2.2. Collaboration mechanisms

Despite the above-mentioned obstacles, previous studies have suggested ways to mitigate the tension and improve the relationship between the actors.

Prior research has asserted that clinicians can embrace a dual role (Numerato et al., 2012). Additionally, Llewellyn (2001) confirmed that clinicians can manage two roles and contribute to both managerial and medical issues; however, they tend to face the problem of a lack of financial management experience. Thus, studies have proposed suggestions to overcome this lack of experience. According to Oppi and Vagnoni (2020), managerial training that includes accounting knowledge will result in a "hybridization" that combines and evolves accounting and managerial knowledge for clinicians. In addition, training programs could grant clinicians the opportunity to gain the required skills (Llewellyn, 2001) and stimulate their involvement in management processes. Furthermore, it has been suggested that clinical directors should be delegated

to make financial decisions within their units to increase their financial responsibility and their awareness of costs and resource allocation (Nyland & Pettersen, 2004). Furthermore, for Begkos et al. (2019), clinical directors who use costing systems and who engage with finance professionals to obtain financial experience will be able to address and overcome these financial problems.

In addition, the literature has confirmed that imposing accounting information systems on clinicians is ineffective (Macinati & Rizzo, 2016). Alternatively, researchers have suggested involving clinical managers in designing and implementing accounting information systems to orient them toward their information needs (Oppi and Vagnoni, 2020). Likewise, Forbes et al. (2004) argued that the characteristics of accounting information systems represent one of the organizational factors that affect clinicians' approaches toward managerial forms. In addition, according to Scarparo (2006), clinicians believe in accounting information systems that provide them with data that supports their decision-making processes, justifies their actions, and is aligned with the values of patient care. Moreover, Eldenburg et al. (2010) suggested that an adequate accounting information system would boost clinicians' commitment more than financial rewards. This conflicts with Addicott et al. (2006), according to whom rewarding clinicians for their implementation of accounting information systems would improve collaboration and reduce resistance.

Moreover, Campanale and Cinquini (2016) concluded that colonization is inefficient in such an environment, while reciprocal colonization between clinical managers and accountants is more functional. Their study indicated that both accounting and clinical practices should respect each group's interpretive schemes (core values and norms), with no imposition of one logic over the other. In other words, reciprocal colonization would enhance accountants' accountability regarding meeting

the needs of the clinical practice while increasing clinical managers' awareness of financial decisions. Furthermore, Rautiainen et al. (2021) confirmed that healthcare is a complex sector due to its emotionality, which requires accountants to consider techniques that avoid conflict with other logics. Similarly, Fiondella et al. (2016) found that involving medical professions in the design of management accounting systems leads to their successful implementation.

Regarding the communication of accounting information, Begkos et al. (2019) asserted that clinical leaders who depend on numbers-based information would be able to achieve financial efficiency and discharge the financial accountability of their units. Similarly, Nyland et al. (2017) revealed that clinicians who can access accounting data on care delivery would reconsider their activities, which would in turn affect their approach toward accounting information systems, resulting in a higher usage of accounting tools. Therefore, adequate accounting information will encourage clinical managers to collaborate with accountants and enhance their managerial role.

In addition, the literature suggested that lateral relationships (relationships between clinical units and managers) are more helpful than vertical ones (a top-down management style) in HCOs. Nyland et al. (2017) explored the role of non-managerial mechanisms between lateral hospital units as a means of moderating the tension generated from vertical managerial control. They concluded that managerial mechanisms based on vertical relationships do not fit with hospital environments. Moreover, Macinati et al. (2021) asserted that both trust and space based on freedom facilitate the work of clinical managers in balancing economic and medical logics. In addition, Nyland and Pettersen (2004) argued that clinical managers have the vital responsibility of protecting frontline doctors and nurses from exposure to budgetary matters that hinder patient services.

Despite the considerable findings in this section on the complex relationship between accountants and clinicians, ERP as a communication tool was not examined in the studies discussed above. Therefore, this study intended to address this research gap and examine whether ERP systems are a mechanism for mitigating tension or a constraint that will spark more.

2.5. Concluding remarks

This chapter introduced the definition and principles of NPM. It reviewed the research into NPM in developing countries, highlighting the research gap in the public healthcare sector in Arab countries in particular. Furthermore, it highlighted the dilemma generated by accounting practices and managerial mechanisms in the healthcare sector. In this sector, there are different logics at play—medical and economic—with distinct objectives. Thus, different techniques are required to mitigate the tension between them, as it is vital that they work together. This chapter also showed how the provision of adequate accounting information is a crucial factor in this regard. However, accounting information systems are often only designed to fulfill governments requests (Oppi & Vagnoni, 2020). Furthermore, some case studies have shown that accounting information systems satisfy certain medical divisions while failing to support others (Carr & Beck, 2020).

The literature on integrated information systems, such as ERP, was also reviewed in this chapter. The literature emphasized the properties of ERP and its usefulness for management accounting, as well as for HCOs. Therefore, this thesis intended to fill a gap in the research by providing empirical evidence from the public healthcare sector in Qatar on how ERP affects the relationship between clinicians and finance professionals.

Chapter 3: Theoretical Framework

3.1. Overview

The main objective of this study was to investigate the clinical and accounting logics' perception of ERP technology when practicing MAPs. Additionally, it examined the relationship between these two main logics within the existence of ERP logic. The aim of this chapter was to develop a theoretical framework that would be used for an in-depth analysis of the findings in the discussion section (Chapter 6). This section elaborates on the rationale behind selecting institutional logic theory as an analytical tool, as well as other theoretical insights borrowed from the literature.

3.2. Institutional logic

The objective of this study was to provide an insight into the perception of ERP in the public healthcare sector, which is a complex and pluralistic environment. In the literature, various theories have been used in accounting and organizational studies—particularly in the healthcare sector—such as accountability theory (Macinati & Rizzo, 2016). In addition, Cui et al. (2019) adopted the middle-range theory to investigate the development of the costing system in the Chinese public healthcare sector. Other studies have investigated the responses of clinical leaders to managerial mechanisms based on role conflict theory, which stems from role theory (Carr & Beck, 2020). Similarly, Macinati et al. (2021) explored the sources of medical managers' financial accountability based on role theory. Furthermore, institutional theory has been used in previous research, such as that conducted by Modell (2001), who explored the impact of institutional changes in a Norwegian hospital during the new public reform era. In particular, he examined the effect of institutional changes/reforms on senior

management responsibilities and investigated managerial staff engagement in designing and implementing a performance measurement system.

This research implied that ERP as an institutional change should enhance the reform of public managerial mechanisms/instruments to improve societies' public services. However, institutional theories based on the perspectives mentioned above did not appear to fit the intentions of this thesis, as it aimed to explain the nature of the relationship between clinicians and accountants within the context of ERP when practicing MAPs, which has not been analyzed in the above-mentioned studies. Additionally, this thesis aimed to demonstrate the similarities and variations in the practices of these two groups in light of ERP.

In the context of public services, Rana and Hoque (2020) presented a paper on institutional logic to demonstrate the dominance of accountability logic over all others in the Australian public sector. In addition, regarding healthcare, Nyland et al. (2017) adopted institutional logic while investigating the role of clinician coordinators in Norway in moderating the rigorous managerial mechanisms imposed by top management and government. Similarly, Reay and Hinings (2009) embraced institutional logic in their study in order to suggest mechanisms that might mitigate the contest between the competing logics of medicine and business, preserving independence for each group and avoiding the domination of one over the other.

In implementing ERP technology, institutional theory has been adopted by several papers. For instance, Alshirah et al. (2021) used institutional theory to examine the factors that encouraged small-to-medium enterprises (SMEs) to shift to cloud-based ERP in Jordan. Furthermore, the literature presented several types of enterprise information systems, such as institutional logics/institutionalization tools, that streamline business processes by imposing their rules, values, and norms on an

organization's users. In this sense, Gosain (2004) assumed that enterprise information systems compel business processes and have the power to direct users cognitively. Furthermore, he asserted that organizations must manage the contestation sufficiently between such technological logic and other institutional forces. Furthermore, Alsharari (2017) explored ERP in the UAE's public sector in light of institutional logic, focusing on two groups: accountants and IT specialists. Alsharari (2017) referred to ERP as an institutional logic that was successful in its implementation since it complements accounting logic, embeds accounting principles, organizes work, and saves accountants' time. However, in other cases, ERP implementation projects might succeed when their logic aligns with institutional actions/practices, which highlights the importance of customization.

Therefore, stemming from the above insights, this research aimed to fill a gap in the literature by investigating the impact of ERP technology as an institutional change in the healthcare sector, focusing on two distinct groups: clinical and accounting professionals. In addition, stemming from scenarios that portray the rivalry between these two groups in healthcare (Carr & Beck, 2020; Oppi & Vagnoni, 2020; Reay & Hinings, 2009), it aimed to add to the knowledge by examining the role of ERP technology within this potentially hostile relationship. As argued by Lounsbury (2008), researchers who focus on divergent logics will contribute to the knowledge by providing new insights, highlighting the rivalry and motives of variations in practice.

Based on the theoretical insights presented above, this thesis drew on institutional logic to elaborate its findings. Thornton and Ocasio (2008, p.101) defined the perspective of institutional logic as:

> *the socially constructed historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce*

> *and reproduce their material subsistence, organize time and space, and provide meaning to their social reality.*

Additionally, Friedland and Alford (1991, p.248-249) stated that

> *...Institutional logic ... is accumulation and the commodification of human activity ... institutional logics are symbolically grounded, organizationally structured, politically defended, and technically and materially constrained, and hence have specific historical limits.*

The definitions above refer to the role of actors' (clinicians and accountants in this study) identities, cultures, norms, and beliefs in their behavior and perceptions toward institutional changes (ERP in this case). Moreover, Reay and Hinings (2009) described institutional logic as a set of principles that formulate actor behavior. Similarly, Haveman and Gualtieri (2017) theorized that institutional logic is a system of cultural elements that make sense of actors' activities. Furthermore, Reay and Jones (2016) argued that logics are reflected in individual languages and practices. Therefore, it has been suggested that the perspective of institutional logic provides a better interpretation of institutional influence on different actors, including individuals, organizations, and societies (Thornton et al., 2014).

Friedland and Alford (1991) theorized that conventional institutionalism is appropriate to explain behavior toward an institutional change when there are shared interests only; however, it supports isomorphism and neglects the diversity in identities, making it insufficient for other cases. Thus, the institutional logic perspective was developed based on a view of traditional institutional theory, which assumed that social, economic, and political systems affect institutional actions, while the developed philosophy assumes that culture formulates the systems that influence the actors (Thornton et al., 2014).

According to Friedland and Alford (1991), society consists of subsectors that contain institutional orders, each of which has its own practices that explain its cultural

values and principles, representing its institutional contents. Therefore, it could be concluded that these systems play a primary role in the conventional institutional theory that directly influences institutional actions. This differs from the new perspective, which theorizes that such systems have an intermediate role in institutional work, while sub-elements/institutional orders create the institutional contents, which are the primary stimuli. This explains why ERP (as an institutional change) is subject to customization in most cases so that it fits users' needs.

The existence of multiple logics in an organization stimulates different orientations, creating disparate practices that require attention to be paid to the variations in actors' incentives and beliefs in order to deepen understanding of the diversity in their actions (Lounsbury, 2008). Thus, the institutional logic perspective includes a belief in cultural diversity due to variations in institutional orders, whereas conventional institutional theory supports homogeneity in institutional actions. Therefore, building on the above assumptions and referring to the different identities and interests discussed in Chapter 2, new institutionalism or the institutional logic perspective was considered more appropriate to explain the actors' behavior toward the institutional change in HCOs.

3.3. Literature review on institutional logic

A subset of the literature presented HCOs as pluralistic organizations with multiple objectives, authorities, knowledge, and perspectives (Begkos et al., 2019; Ezzamel & Willmott, 1993; Llewellyn, 2001; Nyland & Pettersen, 2004). The institutional logic perspective also suggests that multiple pressures affect the interactions between different professionals and environments (Thornton et al., 2012). Additional theoretical insights from the literature suggested that the plurality of institutional logic triggers heterogeneity in organizational practices, producing

institutional complexity (Greenwood et al., 2011). Based on this concept, HCOs were defined as pluralistic organizations that are subjugated to different institutional orders, making them institutionally complex environments.

According to Vosselman (2016), accountability can be split into two main categories based on their outcomes: disciplining and socializing. Accordingly, discipline/instrumental accountability governs individuals' actions, while social/relational accountability holds the community responsible. A study by Rana and Hoque (2020) expanded on this work, referring to accounting practices in terms of instrumental accountability, which holds public servants responsible for their actions. This reflects the compliance logic of adhering to rules, regulations, and guidelines, as well as the managerial logic related to process, performance, and control practices. In addition, Rana and Hoque (2020) referred to non-financial practices according to relational accountability, which is used to achieve community goals, reflecting public service logic. In line with this theoretical insight, the present research investigated how the attributes of ERP facilitate or challenge agents/public servants to live up to their instrumental or social accountability.

Role theory suggests that individuals in a social context play conflicting roles that demand different expectations (Young, 2015). This fits with the context of the current case study, particularly with regard to clinical managers, as they occupy two conflicting roles. Thus, from the perspective of role theory, clinical managers are held to different accountabilities. This research examined how ERP helps or challenges them to practice various types of accountabilities.

Discussing the development of accountability, Macinati et al. (2021) built upon role theory to examine both clinical managers' financial accountability and the proposition put forward by Frink and Klimoski (2004) that there are two types of

mechanisms to drive accountability: formally from various sources, such as performance reporting, evaluation and monitoring, discipline procedures, and reward and compensation systems; and informally from sources such as social feedback. In addition, based on Vosselman's (2016) accountability classifications, clinicians' informal accountability can be linked to social/relational accountability, while formal accountability is linked to instrumental/managerial accountability based on compliance logic. This research investigated how ERP stimulates accountability and how it helps or hinders users in this accountability. In other words, it examined how ERP helps or hinders public agents in their occupational and organizational professions to produce the desired behavior.

With regard to accountants' responsibilities, the literature speculated that their two main roles are functional (the bean counter role) and local (the business partner role). The functional role intends to produce accurate and reliable data for top management, reducing their involvement in the managerial decision-making process (Oppi & Vagnoni, 2020). In particular, bean counter responsibilities include producing reliable information and reports to delineate the organization's managerial and financial position for higher authorities (Granlund & Lukka, 1998). In other words, bean counters are associated with reporting for the purposes of performance measurement, comparability, and monitoring practices (Carlsson-Wall et al., 2021). Meanwhile, the local or business partner role considers management accountants as vital members of the organization's management team (Maas & Matejka, 2009; Oppi & Vagnoni, 2020). In other words, the local role is geared toward contributing to divisional decision-making processes and helping unit managers achieve efficiency (Granlund & Lukka, 1998). Accordingly, the business partner role includes analyzing data in order to support the decision-making process (Carlsson-Wall et al., 2021). Clearly, the

functional role is related to the centralization strategy (Maas & Matejka, 2009), which is based on fulfilling the requirements of a third-party or extra-organizational needs, such as the demands of governmental agencies. Conversely, the local role is associated with a decentralized strategy (Granlund & Lukka, 1998), which allows management accountants to collaborate with unit managers by providing the required information on unit managerial matters and decision-making processes.

This case study demonstrated which accountant's role ERP supports by answering the second research question. That was done by investigating whether the clinician–accountant is dominative or collaborative. Some studies have suggested that conflicting institutional orders lead to confusion, while others have indicated that competition between different logics leads to the dominance of one over every other (Thornton et al., 2014). In other cases, such as that reported by Reay and Hinings (2009), competition might result in the coexistence of multiple logics.

3.4. Thesis framework

Consistent with the previously mentioned literature on the institutional logic perspective, a conceptual framework was created to enhance understanding and envisage ERP among the selected professions. Figure 1 presents the framework, which shows the relationship between the three main institutional logics—ERP, clinical, and accounting—that will be discussed in Chapter 6. It demonstrates how accounting and clinical logics (identities, norms, and values) perceive ERP logic (characteristics) in light of MAPs. Then, it refers to the effect of the interaction between the logics on both intra- and extra-organizational relationships. In particular, the research investigated the impact of ERP as an institutional logic on the two competing logics (clinical and accounting) and the practice of MAPs meeting intra- and extra-organizational requirements.

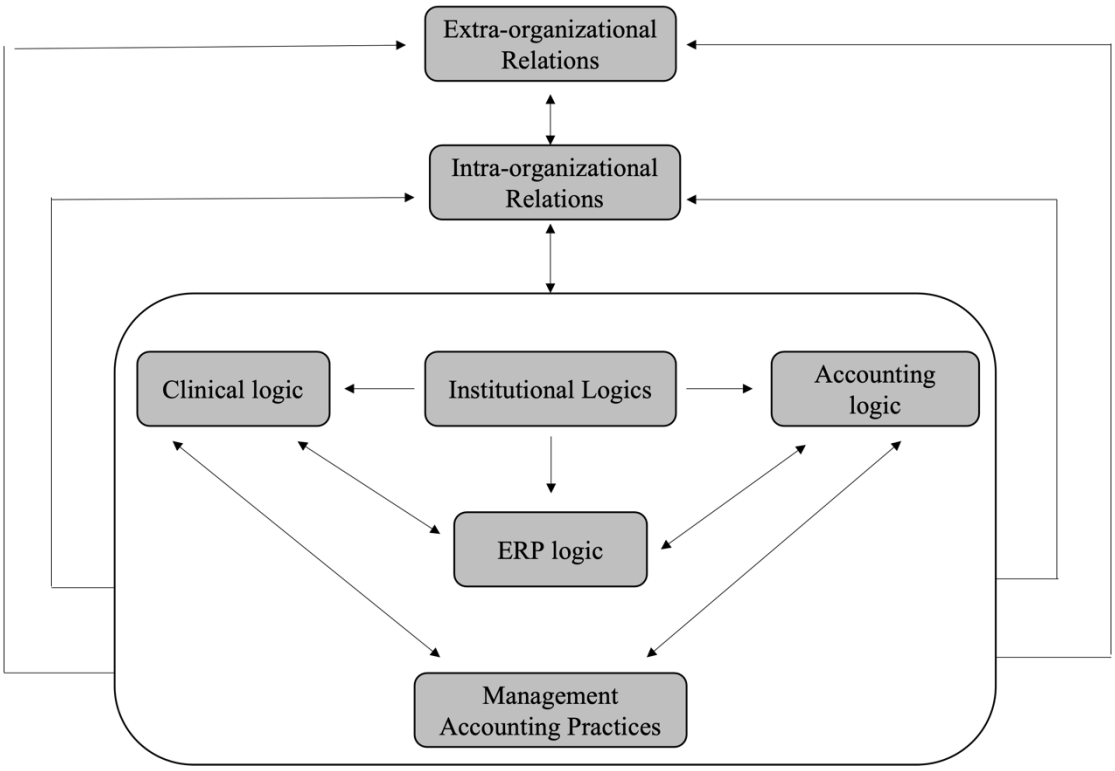

Figure 1. Conceptual framework

3.5. Concluding remarks

In summary, based on the above theoretical background, this thesis adopted an institutional logic perspective in conjunction with other theoretical insights borrowed from the literature. The institutional logic perspective enriched understanding of how each logic responds to ERP technology as an institutional change, considering each profession's norms, values, and beliefs. It portrayed how ERP affects or is affected by different logics. In other words, the research examined how multiple institutional orders—ERP and MAPs—interact with each other, affecting the institutional work

among different professions, considering the impact on the relationship between these professions. In addition, this chapter discussed other theoretical underpinnings to represent the role each group plays and how ERP technology affects these roles, addressing the functionality of ERP in terms of enhancing MAPs and helping actors fulfill intra- and extra-organizational requirements. The next chapter will discuss the research methodology.

Chapter 4: Research Methodology

4.1. Overview

This chapter articulates the research methodology underlying this thesis. It outlines the research approach and method adopted and discusses the research context, types of data collected, and the data analysis process.

4.2. Research approach

A qualitative approach was followed in this study to obtain an in-depth understanding of the impact of ERP in the public healthcare sector at HMC, focusing on two different professions. This approach enriched the researcher's understanding and contributed to the literature by providing a subjective comparison of the impacts of such technology on medical and finance professionals, as well as its effect on the relationship between the two groups.

Qualitative approaches are related to insights more than numbers. They provide an inductive view and are characterized by interpretivist epistemological and constructionist ontological positions (Bryman & Bell, 2015). They are also distinguished by researchers' direct engagement with actors, which provides a deeper understanding by delving into the culture and beliefs in real organizational settings (Parker, 2012). In addition, the literature emphasized the importance of inductive theorizing to obtain a plausible interpretation of a social phenomenon (Bryman & Bell, 2015). Furthermore, this study did not build a theory to be tested; instead, it aimed to construct a theory from the research field findings. This made positivist epistemology inappropriate for this case. Moreover, the literature asserted that a qualitative approach affords researchers freedom and flexibility in theorizing, which leads to reflexivity in interpretations through direct contact and involvement (Parker, 2012), which in turn

enriches understanding of a social context.

4.3. Research method

This thesis opted for a single case study method to obtain deep insights into the selected fieldwork regarding HMC, the main institution providing public healthcare services in Qatar.

A case study strategy is commonly adopted in accounting research. In particular, it is recommended for the area of MAPs as it helps gain a more in-depth and theoretical understanding than that derived from other strategies (Scapens, 2004). A single case study strategy, or idiographic approach, aims to explore the distinguished attributes of an entity and connect them to a plausible theoretical analysis (Bryman & Bell, 2015). As reported by Parker (2012), the reflexivity of a qualitative approach contributes to management accounting research through repetition due to the variation in the implementation of MAPs from one case to another. Similarly, Othata (2002) argued that accounting is a social practice handled by human action and should be examined in a contextual setting due to the variations in a given situation. Thus, a single case study is a good fit for management accounting research as it provides intensive and unique findings that enrich the literature. In this regard, Scapens (1990) asserted that a case study contributes to management accounting research since researchers will be able to replicate the study in distinct conditions. Therefore, based on the above perspectives, this thesis aimed to use a single case study to enrich the literature, with perspectives regarding conflicts in the implementation of MAPs through ERP in the healthcare sector.

4.4. Research context

The State of Qatar is similar to other countries that have been influenced by

globalization and adapted to the changes seen in the world. Qatar has undergone a revival over the last three decades at the economic and social levels. This has resulted in a series of developments, such as new projects, investments, and urban developments, as well as improvements in the education and healthcare sectors, including adopting technology to improve public services. The Qatar National Vision 2030 was launched in 2008 upon the Amiri decision No. 44, which was issued by the Emir of Qatar, HH Sheikh Tamim bin Hamad Al Thani, to set out a general framework for national development (Amiri Diwan, 2022). The vision represents a direction for governmental agencies and ministries in order to formulate their strategies and plans to achieve the vision's targets in order to bring about comprehensive development of the state. The vision consists of four pillars: human, social, economic, and environmental developments (Qatar National Vision 2030, n.d.).

The first two pillars of the vision—human development and social development—are more related to investing in people, particularly regarding education and healthcare. People are the fundamental component of society and investing in human welfare leads to other types of developments. Additionally, as stated in Qatar Second National Development Strategy, (2018), the country is oriented toward achieving efficiency and rationalizing expenditure in order to protect the state's resources. This study shed light on the transformation of the healthcare sector, in particular its adoption of technology, to contribute to the knowledge by filling the research gap highlighted in Chapter 2.

4.4.1. A brief history of healthcare in Qatar

Regarding the history of healthcare in Qatar, Rumaila Hospital was the first hospital established in 1957. Since then, the medical system has experienced a series of reforms, initiatives, and improvements implemented by the government. In 1979, HMC

was founded (Goodman, 2015) by an Emiri Decree. It now consists of a network of specialist hospitals providing secondary healthcare services, while primary healthcare is provided by healthcare centers located in several areas across the country. Currently, these healthcare centers are managed and operated by the Primary Health Care Corporation (PHCC), which was founded in 2012 in compliance with Qatar National Vision 2030 (PHCC, 2018). In 1995, the Qatar Foundation was established by HH Sheikh Hamad bin Khalifa Al Thani and HH Sheikha Mozah bint Nasser Al Missned to transform education and support medical research programs (Chouchane et al., 2011). In 2005, the Supreme Council of Health, since replaced by the Ministry of Public Health (MOPH), was founded to oversee healthcare services (Goodman, 2015). In addition, in 2015, the Sidra Medical and Research Center was established by the Qatar Foundation to enhance knowledge in medicine, especially in biomedicine (Sidra Medicine, 2022). Moreover, Qatar has invested in medical education and founded two medical colleges, Qatar University College of Medicine and Weill Cornell Medical College–Qatar, which is led by the Qatar Foundation in partnership with HMC.

The MOPH in Qatar is currently the authority responsible for health monitoring, regulations, and service evaluation. The Ministry has implemented various initiatives in an effort to adapt to Qatar National Vision 2030 and achieve its targets. Additionally, the National Health Strategy 2011–2016 was launched in 2011 with the aim of transforming healthcare to make public healthcare a world-class service (National Health Strategy, 2018). The strategy emphasized the importance of integrated health systems and the efficient and effective use of resources as part of the efforts taken to achieve Qatar National Vision 2030, particularly in relation to the human development pillar. Additionally, the strategy referred to the intention of investing in research to improve the quality and focusing on providing proactive healthcare—which aims to

protect patients from errors and prevent healthcare problems—and emphasized the importance of investing in technology for better healthcare.

Another strategy created by the MOPH was the National E-Health and Data management strategy, (2015). It deals with implementing technologies and innovative applications in the public healthcare sector in Qatar. The strategy is an extension and complementary plan for the previously mentioned National Health Strategy. It began the transformation of public healthcare in Qatar from a paper-based environment to integrated e-healthcare. The National E-Health and Data Management Strategy, (2015) emphasized the importance of investing in information and communication technologies (ICT) to enable the medical system to meet the demand for excellent healthcare, given that the aim of the National Health Strategy was to transform the healthcare service into a world-class care provider.

The National E-Health Strategy highlighted that continuing paper-based work would put the medical system in Qatar under pressure to provide effective healthcare services, especially given that the economic revival of Qatar—and the resulting investments and projects—had led to population growth. This required the medical system to transform both its capacity and quality. The National E-Health Strategy confirmed that investing in IT would enhance the safety, quality, reliability, effectiveness, accessibility, and capacity of the healthcare sector. Additionally, it asserted that such investment would support both the decision-making process and research, given that IT improves data quality and provides data analytics, which enables evidence-based healthcare.

4.4.2. HMC

HMC was selected as the research field as it is the main public healthcare provider in Qatar, operating and managing three community and nine specialist

hospitals. It also provides additional services, such as ambulances and home care. According to HMC Corporate Brochure, (n.d., p.1), it intends to deliver the "safest, most effective and compassionate care."

In accordance with the health strategies discussed above, Cerner was implemented in HMC in 2014 in a batch of hospitals in order to transform them from paper-based health environments into e-health providers. Cerner is a commercial and pre-packaged product that provides a platform for EHRs. To fit with HMC's needs, it required a vast amount of customization; clinical members were involved, and their needs and suggestions considered, in the pre-implementation stages. Upon its successful implementation in 2015, it was launched in the remaining hospitals. Cerner has been integrated with other applications, such as those used in laboratories, pharmacies, surgery, and emergency medical services. It has also resulted in the integration of all HMC hospitals, as well as PHCC centers.

The other aspect of HMC is administration; the previous system was designed internally, and users experienced problems in terms of reliability and validity. Additionally, the legacy system did not have the capacity to serve a large number of users; in other words, it was unable to keep pace with new health strategies and transformations. Moreover, it was not centralized and did not support the automation of administrative processes. Thus, a lot of the work was done manually, and the data was not analyzed in real time.

To improve and streamline business processes and operations, Oracle was implemented in HMC in 2013. Oracle is a commercial, pre-packaged product that has been customized to adapt to HMC's policies and procedures. HMC required rapid implementation; thus, it selected Oracle given that it is easier and faster to customize compared to other products, such as SAP. Oracle enabled the centralization of the

administrative side of HMC as it comprises an HR management system (payroll, pay slips, and employee management), finance (accounts receivable, account payable, general ledgers, costing and budgeting, patient accounting, and cash management), and supply chain management (central distribution center and suppliers' applications). Oracle can be connected with other specialized accounting systems, such as Hyperion (budgeting system). In addition, it provides a central database for the entire HMC as it is integrated with its medical software (Cerner). Therefore, the term ERP in this research referred to ERP integrated with other specialized applications.

4.5. Data collection methods

4.5.1. Primary data

This study was predominantly based on primary data retrieved from semi-structured interviews with participants from HMC. To ensure the quality of the research and the reliability of data, the interview guidelines were corrected and enhanced by the researcher's supervisor before the interviews were conducted.

To understand the impact of ERP technology in the healthcare sector (HMC) in the context of MAPs, two main groups were selected: accountants and clinicians. The incorporation of emic and etic perspectives has been advocated for and demonstrated in previous studies (Morris et al., 1999; Oppi & Vagnoni, 2020). Taking an emic perspective is to understand the specificities of one culture, while an etic perspective views phenomena through cross-cultural similarities and differences (Fetvadjiev & van de Vijver, 2015). This overall approach fit well with this thesis; an emic perspective was adopted to understand the impact of ERP technology on clinicians and accountants, while an etic perspective was adopted to highlight the similarities and differences between the two distinct groups regarding ERP. Furthermore, both perspectives were used together to deepen understanding and envisage the nature of

the relationship between finance and medical professionals. In addition, this research explored MAPs, which are a part of the principles of NPM. Accountants and clinicians are essential parties to NPM reform (Oppi & Vagnoni, 2020). In such practices, accountants are information providers, while clinical managers are pushed to become involved in the management process (Carlström, 2012; Jacobs, 2005; Kurunmaki et al., 2003; Llewellyn, 2001).

Interviews are commonly used in qualitative research (Bryman & Bell, 2015) as they provide intensive understanding and a subjective interpretation of the research questions (Mahama & Khalifa, 2017). In addition, Dai et al. (2019) concluded that management accounting research is the area within accounting in which an interview-based qualitative approach is most commonly adopted. However, there have been various critiques on the use of interviews; some researchers such as Manzoni, (1994) have pointed out that they depend on the participants' abilities to give explanations (as cited in Marginson, 2004) and reflect the interviewees' personalities (Medico, 2005). Nevertheless, semi-structured interviews provide researchers with guidelines to ensure all issues are covered.

This method also establishes scope regarding the freedom the interviewees are given to express their opinions and provides flexibility for researchers to address new issues (Bryman & Bell, 2015; Horton et al., 2004), making it more popular than other types of interviews (Qu & Dumay, 2011). In addition, Myers and Newman (2007) have reported that the majority of information system studies use semi-structured interviews. Moreover, Qu and Dumay (2011) asserted that interviews of this type reflect the participants' beliefs and responses to their duties. Thus, based on these perspectives, semi-structured interviews fit well with this case study since it aimed to explore users' perceptions of ERP technology and its impact on MAPs by adopting the theory of

institutional logic perspective.

In addition, Medico (2005) recommended the use of open questions to increase expressivity. Furthermore, researchers may plan a specific duration for the interview depending on the interview guidelines and saturation level; however, Manzoni, (1994) argued the participants' tendency and ability to debate and illustrate their point may mean the interviews last a long time (as cited in Marginson, 2004). In addition, it has been emphasized that interviews should be recorded to enable the researcher to pay more attention by not taking notes and to protect the data (Mahama & Khalifa, 2017). In addition, Marginson (2004) pointed out that the time pressure faced by managers at work might affect the interviews. To avoid the above-mentioned issues, the sample size on the medical side was extended to ensure the saturation level was reached, given that the positions of these subjects are sensitive, and their time is devoted to serving and protecting patient health.

Qatar University's Institutional Review Board (IRB) issued the ethical approval required to collect the data. In addition, HMC's protocols were followed to obtain approval for this research, which required a researcher certificate to ensure data privacy and security. To obtain this, the researcher fulfilled the requirements of a Collaborative Institutional Training Initiative (CITI) program. After this was completed, the participants were invited to participate through HMC's official email address. The interviews were audio-recorded. Concerning ethical principles, the nature and aims of the study were explained to the interviewees before obtaining their approval to participate. In addition, they were given the option of having their recording deleted upon completion of the study. The participants were also given the opportunity to look at the interview questions before the interview itself. Furthermore, a consent form was sent by email confirming confidentiality, anonymity, and the right

to withdraw from the study or to decline to answer any question.

Dai et al. (2019) investigated the number of interviews used in accounting research and found a reduction over time, with the majority of studies conducting 11–15 interviews to reach saturation. As shown in Table 1, a total of 12 interviews lasting 20–60 minutes were conducted with medical and finance professionals from HMC. The final interview (No. 12) was excluded from the analysis because it was found not to be useful as the participant was speaking in general and expressed positive feelings without providing any details. Due to COVID-19 and the sensitivity of the field, most interviews were conducted via telephone, with two conducted face-to-face. There have been some critiques of telephone interviews, including the resulting lack of observation and response to facial expressions. However, physical absence may also encourage interviewees to participate further due to an increased sense of anonymity. Furthermore, they are useful regarding both participants who are difficult to reach and safety concerns (Bryman & Bell, 2015), both of which were relevant during the COVID-19 lockdown.

Regarding the limitations of the study, there were many unsuccessful attempts to acquire participants. The original intention was to have a balanced number of participants from each group. Unfortunately, this could not be achieved due to many restrictions. The researcher is not part of HMC, which neither helped to build trust with people nor encouraged them to participate, especially given that the data was collected during the COVID-19 lockdown when outsiders were not allowed to access medical facilities. Reassurances were given by sending a consent form and providing the interview questions in advance to give potential participants an idea of the boundaries of the research. However, this was also repeatedly unsuccessful, especially on the finance side.

On the clinical side, efforts were made to approach different positions, including frontline medical doctors and nurses, those holding senior positions in business development, and clinical managers from several levels (heads, leaders, and directors). Initially, 16 candidates were contacted, as per the availability of contact information, by both phone call and email. Finally, nine candidates agreed to participate from the medical side, as shown in Table 1. Therefore, the scope of the research was narrowed to focus on clinical managers in the medical group.

Table 1. List of interviewees

Interview No.	Job Title	Experience in HMC	Interview Duration	Interview Date
1	Leader of Nurses - Home care	+10 years	1 hour	Dec 29, 2020
2	Head Nurse - Outpatient Department	7 years	30 minutes	Dec 29, 2020
3	Director of Nursing - Emergency	20 years	45 minutes	Dec 30, 2020
4	Head Nurse - Critical Care	4 years	20 minutes	Dec 31, 2020
5	Assistant Executive Director of Nursing	17 years	30 minutes	Dec 31, 2020
6	Assistant Executive Director - Clinical Support	8 years	25 minutes	Jan 24, 2021
7	Pharmacy Director	13 years	20 minutes	Jan 5, 2021
8	Pharmacy Supervisor	13 years	16 minutes	Jan 6, 2021
9	Manager - Supply Chain Management	2 years	25 minutes	Jan 19, 2021
10	Accountant and Finance Planning Analyst - HR	1 year	20 minutes	Jan 5, 2021
11	Financial Analyst - Finance Department	8 years	1 hour	Jan 28, 2021
12	Frontline Nurse	3 years	10 minutes	Jan 6, 2021

On the finance side, the process was more complicated; eight candidates were contacted, but only three were reached and accepted to participate. In general, accounting professionals are reluctant to conduct interviews as they perceive that

accounting students might ask about financial data, which could threaten their job should they reveal confidential information. This was the issue for accounting professionals at other hospitals. Before HMC agreed to participate in the research, two other hospitals were contacted; however, they declined due to the sensitivity and confidentiality of financial data. Thus, it is evident that this issue is not restricted to HMC. This issue complicated the data collection process and meant it took longer to find participants for the finance side. Furthermore, the intention was to only include participants with at least six years' experience at HMC in order to demonstrate an acceptable perception of the new technology given that it was fully implemented at the end of 2015. Moreover, this research was conducted to fulfill the requirements of graduation; therefore, the timeframe was limited. This meant that it was impossible to spend a long time obtaining a balanced number of interviewees from each side or commit to the inclusion criteria.

In line with both Manzoni (1994) and Marginson (2004), the tactics used during the interviews included using follow-up questions to clarify any issues that arose and to obtain deeper insights from the responses as much as possible. First, the interviewees were informed that their responses would not be judged as right or wrong and that the study was instead looking to obtain insights into how practitioners at HMC deal with ERP technology in their day-to-day activities. Second, the interviewees were kindly asked to illustrate their opinions using examples from the functions they perform. Third, they were asked to expand on their perceptions by inquiring, for example, as to why an employee in the finance department thought that ERP was complicating their work. The interview guidelines were used to gain participants' perspectives on both the positive and negative aspects, and they were asked for examples from their routine work. This reflects the flexibility of interviews

compared to surveys and their ability to provide more opportunities to deepen understanding of the phenomena. Finally, some of the participants' responses were re-phrased and repeated to them to obtain a precise understanding and ensure the reliability of the data.

4.5.2. Secondary data

Secondary data was used in conjunction with the interview findings to support the discussion. In addition, it was important to triangulate the data to strengthen the research and provide greater reliability and credibility. In this sense, Ji (2017) argued that researchers adopting a case study strategy should first review secondary documents to understand an organization's practices. Similarly, Marginson (2004) asserted that for the case study method, researchers should rely on more than one source of data to validate the findings.

Table 2. List of secondary data documents

No.	Document	Source
1	Qatar National Vision 2030	General Secretariat for Development Planning
2	Qatar Second National Development Strategy 2018–2022	Ministry of Development and Planning Statistics
3	National Health Strategy 2018–2022	MOPH
4	Nursing and Midwifery Strategy 2019–2022	HMC
5	National E-Health and Data Management Strategy	Price waterhouse Cooper

In this study, documents relating to the previously mentioned strategies were selected since the focus was on ERP and MAPs, both of which are related to strategic decisions and should facilitate achieving strategic objectives. Table 2 below presents the documents that were retrieved from relevant websites.

4.6. Data analysis

The audio-recorded conversations were listened to and transcribed. Identifiers were removed from the transcript, and the participants were labeled to ensure confidentiality and anonymity. A thematic analysis process was adopted to analyze the data and answer the research questions.

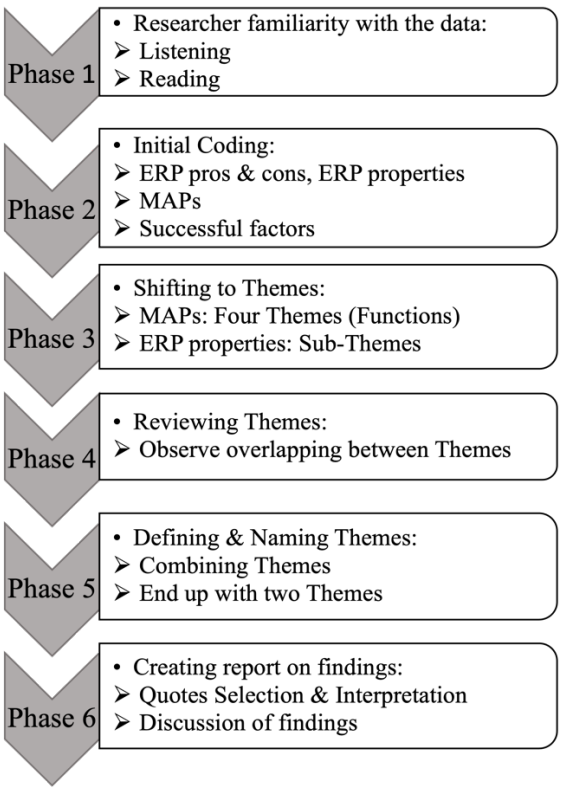

Figure 2. Thematic analysis phases adapted from Braun and Clarke (2006)

Figure 2 was created in accordance with Braun and Clarke's (2006) approach to thematic analysis. First, the transcript was read analytically to highlight important issues and make notes. The next phase was to create succinct codes to act as the material bricks and units to build the report (Braun & Clarke, 2006). In this phase, the data was concisely coded based on significant issues that were observed. Three main coding titles were used: attributes of MAPs and ERP, benefits and challenges, and factors in the successful implementation of ERP. In the third phase, the codes were used to construct the theme (planning, decision-making processes, accountability, and control), and the ERP properties were considered subthemes. Braun and Clarke (2006) assumed that reviewing the themes in the fourth phase would end up either shrinking or expanding the number of themes. In this case study, the four main themes used in the third phase were merged into two main themes, which were defined as (1) planning and decision-making functions and (2) accountability and control functions. These were accompanied by related subthemes, as shown in Figure 3. Finally, similar quotes were sifted for each subtheme, with certain quotes selected for interpretation and discussion.

This study aimed to understand the effect of ERP technology on MAPs considering two groups of professionals in HMC: clinicians and accountants. Therefore, as shown in Figure 3, the findings were grouped into two main themes: (1) planning and decision-making processes and (2) accountability and control. The subthemes of ERP were the characteristics that affected the main themes. The next chapter will explain in detail how each property of ERP (subtheme) affects each of the MAP themes from the perspectives of the different professions.

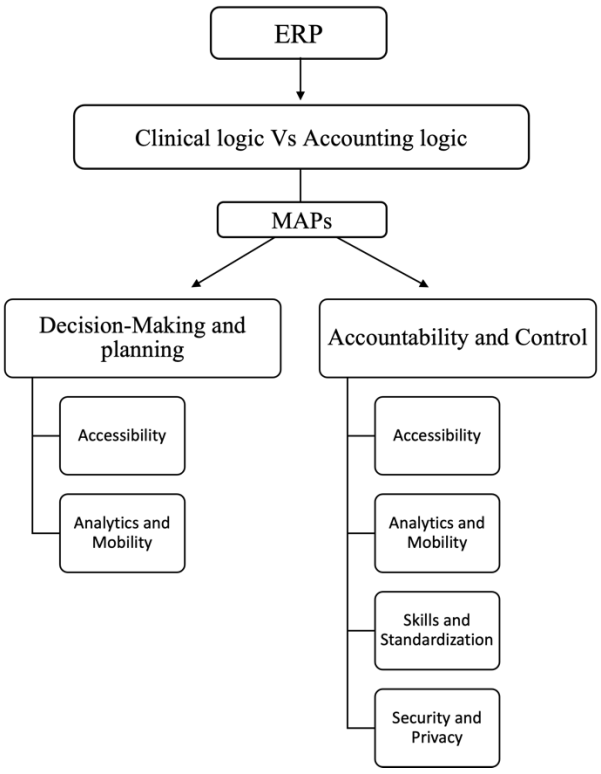

Figure 3. Summary of themes and subthemes

4.7. Concluding remarks

This chapter discussed the methodology used in this study. It outlined and justified the adoption of the research approach, strategy, and context, as well as the data sources and analysis. This thesis adopted a qualitative approach and a single case study strategy. The data was collected primarily from interviews conducted with HMC members and was analyzed following a thematic analysis approach. This chapter contained the figure showing the final themes and subthemes that will be used in the next two chapters (findings and discussion). The next chapter will present the interpretations and explanations of the findings.

Chapter 5: Research Findings

5.1. Overview

This section presents the findings of the interviews conducted with both the clinicians and accountants. Based on the interview findings, the chapter is divided into sections that are focused on the two main themes of MAPs: (1) planning and decision-making processes and (2) accountability and control. For each function, the role of ERP characteristics will be discussed as the subthemes of the functions influencing clinicians and accountants.

5.2. Planning and decision-making processes

The first domain is related to the planning and decision-making processes in MAPs. MAPs are the instruments that support an organization's strategy and assist it in achieving its goals and vision. An organization will begin by setting short- and long-term plans to achieve its goals. Thus, planning is a fundamental MAP that encompasses other practices, such as performance measurement, cost management, budgeting, and other decisions. This section will discuss the impact of ERP on planning and decision-making processes in light of the two subthemes shown in Table 3.

5.2.1. Integration and accessibility

The first subtheme was accessibility, which refers to the ease of access to data. It extends to include availability and integration, which are the essential aspects of ERP (Scapens & Jazayeri, 2003). The existence of an information system in healthcare institutions across an entire organization supports medical professionals in focusing on clinical outcomes (Institutional Investor Systems, 1996). In HMC, ERP bridges the

gaps among its many facilities, making data available for various users and enhancing intra-organizational communication. Accordingly, ERP enables all care providers in the hospital to share patient records (Rosenbloom et al., 2007).

Table 3. Summary of the findings on the first function

Function 1: Planning and Decision-Making Processes	**Clinicians (Patient Care Role)**	**Clinicians (Managerial Role)**	**Accountants**
Accessibility	○ Quality of care services: ⇒ Accelerate services: less time and effort ⇒ Accuracy: treatment plans ⇒ Proactive decisions ○ Patient safety: ⇒ Medication dispensing ○ Support research and improvement	○ Individual performance evaluations: ⇒ Validation and verification ⇒ Accuracy and acceleration ⇒ Less time and effort ○ Resource management: ⇒ Better allocation for patient safety ⇒ Equipment selection ⇒ Inactive for capital asset allocation ○ Financial role: ⇒ Budgeting	○ Intra-organizational relationships: ⇒ Real-time data, facilitate budgeting, and resource management ⇒ Role in critical conditions, e.g., COVID-19, at the facility level ⇒ No transparency at unit level ○ Extra-organizational relationships: ⇒ Optimal and effective supplier selection ○ Time-consuming for non-routine missions: ⇒ More responsibility to think outside the box, making data available for users
Analytics and Mobility	○ Accelerate service: ⇒ Less time and effort ⇒ Accurate decisions ⇒ Timely decisions ⇒ Proactive decisions: telemedicine ○ Capture unit performance: ⇒ Prompt decisions for timely service	○ Capture unit/facility performance: ⇒ Improvements ⇒ Clinical wisdom required ○ Resource management: ⇒ Maintain sufficient and efficient level of supplies ⇒ HR management at unit, facility, and corporate levels for effective care services ○ Inactive for individual performance evaluation	○ Dynamic environment: ⇒ Immediate decision to protect patients ○ Capture individual performance ○ Generate reports for: ⇒ Costing ⇒ Budgeting

On the medical side of the organization, the interviewees identified the benefits of this availability. Regarding patient care, the executive director of nursing (Interviewee #5) stated that:

> *"Especially for patients who have chronic diseases ... we record a lot of information and volumes [on paper], it wasn't easy to get the history if the patient could not communicate, well ... now, it has become easy. I think it contributed a lot to improving the treatment plans and outcomes." (Executive Director of Nursing)*

The above response highlights the favorable influence of ERP on patient care, with the executive director commenting on how the situation has improved. ERP facilitates access to the required patient data, especially in cases when a patient is suffering from a chronic disease and is unable to communicate with physicians properly to provide accurate information on their disease history. In this case, ERP helps the physician obtain the required data quickly, retrieving what the physician needs within a few seconds. This means that physicians do not need to spend time reviewing many pages to determine a course of treatment. Furthermore, the assistant executive director in clinical support (Interviewee #6) confirmed that "*you don't have to run around to get the patient file, so you are able to make an [immediate] decision for a patient, [even] before [they] arrive.*" *" (Assistant Executive Director - Clinical Support).*

Thus, accessibility provides physicians with more time to review patients' information rather than looking for or waiting on the file, or the patient, to arrive. Thus, it enhances the proactive decision-making process as physicians can rapidly locate patient records and prepare treatment plans even before the patient has reached the facility. This suggested that this feature of high availability should be mandatory, particularly in emergency cases, as it can assist the team in protecting a patient's life.

Therefore, it was evident that ERP reduces service delivery time since it enables physicians to quickly determine a course of treatment. Consequently, it accelerates service delivery, reducing the number of patients in the waiting area, which creates more time to serve more patients than was possible in the past. In the same context, the leader of nursing in home care (Interviewee #1) mentioned the issue of handwriting, stating that "*you cannot understand [doctors'] writing, or the nurse who wrote in the file before you.*" *" (Leader of Nursing - Home Care).* This quote captures how ERP has created improved service quality at HMC. Furthermore, it helps care providers to access more reliable data; patient data is available digitally, which is clearer and more accurate than handwritten notes. In turn, this accuracy leads to the determination of appropriate treatment plans. These findings are consistent with HMC' Nursing and Midwifery strategy (2019), which documented that one of HMC's aims is to provide effective care by delivering proper treatment.

Similarly, the pharmacy director (Interviewee #7) stated that

> *"We check, for example, lab results, patient age, patient history, everything that affects our decision to dispense or not dispense the medication—of course, after the consultation with physicians and the nursing—yes, it helps very much." (Pharmacy Director)*

This quotation indicates that ERP provides accurate and up-to-date data on patients from different departments, facilitating accurate dispensing decisions and reducing the likelihood of medication errors; accordingly, it protects patient lives. Another issue was brought up in the interviews in relation to medication that requires self-preparation by a staff nurse. As stated by the executive director (Interviewee #5):

> *"We have some machines that have a built-in medication library … so, the nurse will not depend on memories or references the same way we used to previously. So, this medication order, the patient's weight, and medication's strength … prepare X, Y with a particular rate …*

all by programming .... you don't need to do any mathematical calculations." (Executive Director of Nursing)

This explains how the medication library, which integrates pharmacy records and EHRs, functions. ERP takes advantage of this link and retrieves patient data that already exists in the database. Hence, it helps staff nurses deliver accurate medication doses to patients via integrated data and reduces the burden and accountability as it depends on artificial rather than human intelligence. In this way, it protects patients' lives—which is the top priority in this environment—by reducing the likelihood of medication errors. In addition, nurse's executive director (Interviewee #5) highlighted the role of data availability in decisions related to improving healthcare services:

"It hugely supported the research, and, you know, the research contributed to improve the service, so we [now] have a dataset, a data warehouse, so a lot of matters have been improved" (Executive Director of Nursing).

This quotation shows how integration enriches the database, which enhances the research program, enabling it to suggest more ways to improve healthcare services. Therefore, the decisions and suggestions made to improve patient care are supported by evidence extracted from the database. This result indicates that ERP aided in achieving the goal of HMC' Nursing and Midwifery strategy (2019) to provide evidence-based patient care.

From an administrative perspective, one of the head nurses interviewed (Interviewee #2) mentioned the availability of data for individual performance evaluations. He stated that:

"It gives me a brief about each staff employee as to whether [there are] any discrepancies like ... absences or sick leave. ... This information will be included in [their] appraisal. Therefore, the overall score will be affected by information that I have in this system." (Head Nurse)

The nursing leader in home care (Interviewee #1) added that:

> *"The time sheet or attendance—before, we used to do it manually. Just imagine, for 270 employees … review it, edit the errors. … Now, it's easy; employees will do it by themselves, and I am going to approve it … just imagine [the] effort that has been reduced. It [has] reduced the error percentage." (Leader of Nursing - Home care)*

Furthermore, the head nurse (Interviewee #2) highlighted that:

> *"It is approved by me and a higher supervisor … no need to send papers to my manager … the staff uploads it, I approve it, the director approves it … no meeting … everyone can review the same file … no [wasted] time on something that [we] all can look at … in a shared place." (Head Nurse)*

Therefore, the availability of the information also enhances the managerial role of clinicians. Evidence is now accessible to clinical managers, and some responsibilities can be delegated to their subordinates, such as preparing attendance sheets, then revised and approved by the managers. In this way, ERP has promoted the segregation of duty mechanisms, and clinical managers no longer have to correct their work, reducing errors and enabling them to make the right decisions when it comes to evaluating nurses' performances. In addition, the above quote from the head nurse highlights how the level of integration connects all officials responsible for approving individual performance evaluations. These include clinical managers inside the medical facilities and the HR department. Thus, the findings confirmed that integration speeds up the performance evaluation process, as all parties can access the same document on one database simultaneously.

On the topic of resource management, the executive director of nursing (Interviewee #5) confirmed that:

> *"We know our activity volume ranges, so 'do we have enough beds to admit the patients who come through the emergency [department]?' The system tells me that X patients are in the hospital, and we are expecting, like, Y patients … by the way, to provide more*

> *beds, it is a lot of work … discharging Z patients who have been saved to go home is not an easy job. It is a multidisciplinary decision … so, we need to be prepared in advance." (Executive Director of Nursing)*

The director of emergency nursing (Interviewee #3) said that:

> *"I will send a request to purchase a piece of equipment [and] the engineering department will tell me that we have X offers, but only four of them [can] be integrated with Cerner. I will message them that I need this type of data [and ask] what type of monitor [is required]." (Director of Nursing - Emergency)*

One of the head nurses interviewed (Interviewee #2) added,

> "*If I have equipment that I want to send or receive from another department, rather than email, there is no communication through Oracle. Definitely, if this is possible in the future, it [would] be helpful.*" *(Head Nurse)*

This response from the director of emergency nursing reveals that integration feeds the clinical units with the desired real-time data from related departments, allowing clinical managers to establish a plan and make the right decisions proactively. Thus, integration allows them to allocate their resources, protecting patient health and life. In addition, the above responses show that integration works as a guide to determine the appropriate monitor in a given situation. It has transferred HMC onto a huge network where data is moved efficiently and quickly between departments and facilities. Real-time and automated data flows have thus become a necessity at HMC. Hence, clinical managers seek monitors that are compatible with ERP and exclude those that do not support the technology. However, they are not fully satisfied since the capital resources management process—which includes medical monitors and machines—is not yet integrated. To clarify, ERP does not include monitors in the same manner as supplies and other consumable resources, meaning the allocation of capital assets falls outside the scope of ERP.

Regarding clinical managers' financial role, the executive director of nursing (Interviewee #5) said that:

> *"Our clinical plan for next year is to bring X type of surgery to this hospital. It requires this machine and instrument budget, this manpower budget, and this variable cost, and we determine whether we need to buy or sign a contract with a company to lease us the instruments, or to give us the instruments free, given that we will [only] buy the consumable from them." (Executive Director of Nursing)*

Thus, the accessibility of ERP means that it informs clinical managers on the volume and types of surgeries that physicians have decided on for the next period. In this way, ERP supports clinical managers' involvement in various management mechanisms, such as budget allocation. Carr and Beck (2020) suggested that clinicians should be involved in management by increasing their responsibilities to undertake both service delivery and resource allocation within their subunits. Such involvement also balances the power within decision-making processes among medical and finance professionals.

In the same way, the financial analyst (Interviewee #11) expressed satisfaction toward the current level of integration in the finance department, stating that:

> *"There is the supply team, finance, Cerner, My Care (which considers patient payment). All of those systems are now integrated into one single system, the data is flowing from multiple systems, and most of them are basically automated after working hours … there is a cycle to run for each system." (Financial Analyst)*

To illustrate this, he (Interviewee #11) also specified how this advantage is useful for the budget system, stating that:

> *"Around 12:30 AM, the integration process starts. I get all the employees' information from [the] HR system, and I post all budget-related data on how many doctors, nurses, people were recruited … how many nurses are already in the recruitment process, how many vacancies are available … so that I know how much budget I will*

spend." (Financial Analyst)

This shows how each solution in HMC is connected with related applications, which launch one another based on the required information. ERP is programmed in such a way that it carries out an automatic process that transfers the data daily at a specific time from one department to another. For instance, the budget department demands information from all departments to prepare the annual budget. In particular, the financial analyst explained the communication between the budget and HR departments. He is the administrator for the budgeting system (Hyperion), which is integrated with ERP, and he receives up-to-date information about the recruitment process daily from the HR department. This information includes the number of recruited employees, those expected to be hired, and the number of vacancies left for the financial year. Thus, accountants can accurately decide on an annual budget for the next financial year based on retrospective, prospective, and proactive incident data.

Concerning extra-organizational relationships, the financial analyst (Interviewee #11) stated that:

> *"A supplier registers the supply chain, they submit terms like performance [forms], [guaranteed] money, etc. … The supply chain processes it, then it [comes] to finance … everything is in the system, all this happens like shopping on Amazon: register, sign up, put in your details, payment, upload documents … done! Confirmation for the amount, deposit, and receipt by HMC takes like 24–48 hours." (Financial Analyst)*

This shows that HMC has developed an integrated solution, using ERP to trade with suppliers; all details provided by the suppliers flow into the supply chain management system, and these are then given to the finance department to process the payment. In this way, the prompt communication of data allows the decision makers in both supply chain management and finance to select the appropriate offer at the right time. This

process is highly advanced as it is executed with no time or effort wasted on meetings or paper forms, meaning that it is in the interest of both HMC and the suppliers. Since this solution involves collecting several options from different suppliers, it enables HMC to efficiently restock its warehouse whenever necessary and based on the best offer. Furthermore, it provides suppliers with a quick response from HMC, enabling them to accomplish their business transactions within a shorter timeframe.

With regard to the COVID-19 pandemic, the financial analyst (Interviewee #11) confirmed that ERP played a vital role during this time:

> *"The size is like 30,000 plus, and we have other hospitals in five lines. ... HMC handled it because of the strength of their IT team. Everybody was able to put in [the] effort, and they [knew] what they have to do. Then, they managed it very well. For other organizations, it was a failure." (Financial Analyst)*

The supply chain manager (Interviewee #10) agreed with this point:

> *"We [faced] distribution infusion for resources, such as PPE [Personal Protective Equipment] items, masks, gloves, gowns. So, we [could] see through Oracle, for example, that Al-Wakra Hospital has excess; so, we can arrange [it at] that movement. And really, Oracle worked [well] at that time. We could efficiently transfer items from facilities to serve other facilities." (Supply Chain Manager)*

Under such critical conditions, HMC members needed to communicate promptly with one another and provide and receive real-time data to solve problems and make good decisions. ERP enabled communication and coordination among the facilities during the COVID-19 period. The above responses indicate how ERP allowed for planning and decision-making regarding MAPs to take place simultaneously. The supply chain manager illustrated how HMC managed hospital resources through ERP, which transparently conveyed the status of each facility's supplies, allowing them to decide which facilities lacked supplies and which facilities could provide them with what they needed. Therefore, they were able to determine

the reallocation of existing resources effectively during lockdown. In this way, ERP supported organization strategies, which intended to improve organizational communication across multiple functional areas (HMC, 2019). However, the financial respondents indicated there were also a number of challenges. For example, with regard to supply chain management, the supply chain manager (Interviewee #10) stated:

> *"After the items leave the warehouse and are delivered, I don't have access to see what the clinical departments have … consumed or not. I believe it would be better if all of us [could] see what each person has, I mean, to remove the barriers. Instead of relying on word of mouth, we want to see in the system what they actually have in their hands" (Supply Chain Manager)*
>
> .

Despite the fact that ERP has moved HMC to a degree of integration, based on the above quotation, it is evident that the manager considers that full integration has not yet been achieved. He described a situation in which, at the facility level, they are able to manage resources and decide which facilities lack consumable items and which have excess so they can re-disseminate these items. However, the door is not open for the warehouse to oversee consumption at the unit level. Although warehouse members consider this a disadvantage of the system that hinders their decision making, it could also be interpreted as a method of decentralization that avoids intervention from the finance side and that could give clinical managers more control over their units. Furthermore, the financial analyst (Interviewee #11) complained:

> *"As a consultant, you have to think immediately, 'How can I do it?' Most requests come with a very limited timeframe, so you have to think outside the box: 'What is the solution you will provide them?' It is a big challenge, but because we [have been] doing this for a long time, it is doable—but yes, it is challenging." (Financial Analyst)*

He (Interviewee #11) added:

> *"If you [are carrying out] day-to-day tasks, it is not complicated …*

but when we are preparing the entire HMC's financial year, we stay for long hours to make sure that everybody has submitted their requests. All the budgets we have approved from the Ministry are posted to the ERP system so each facility can see how much is available for them … yes, it is challenging." (Financial Analyst).

The financial analyst reported overall satisfaction with ERP. However, it burdens him with additional responsibilities; he now has to think unconventionally and creatively to make other users' data available as they used to be able to find it more easily. Accordingly, he battles to make the right decisions at the right times to enable other users to accomplish their tasks. Interviewee #11's response also highlights the simplicity and usefulness of ERP for users performing daily and routine tasks, as the data is given to them as a final product. In contrast, ERP makes non-routine and unusual tasks, such as budgeting or problem solving, exhausting and time-consuming because those responsible for preparing this information also have to make the data accessible to other users so they can perform their routine activities.

In summary, in terms of planning and decision-making processes in MAPs, accessibility has a positive impact on both clinicians' roles. Regarding their clinical role, it notably enhances the quality of care services and quickly, effectively, and accurately produces treatment plans. It also protects patient safety by reducing medication errors. Furthermore, it has transformed patient care services by contributing directly to research. Regarding clinicians' administrative role, ERP supports the individual performance evaluation process, which saves clinical managers time and effort, reduces errors, and advances communication between facilities. In addition, it enhances resource management by considering patient safety a priority, guiding capital asset decisions, and involving clinical managers in management tasks, such as budgeting. However, clinical managers complain that capital asset allocation is not yet integrated. From a financial viewpoint, they agree

that it connects facilities, which enhances resource management and budgeting processes. It also enhances relationships with third parties, such as suppliers. However, those working in warehouses do not believe that HMC is fully integrated, since resource monitoring is not currently possible. In addition, those on the finance side revealed that ERP increases the burden and timeframe of completing non-routine tasks, although it simplifies routine activities.

5.2.2. Mobility and analytics

Previously, ERP was restricted to use inside HMC, and the data was never updated remotely or after working hours. In an urgent case, the manager had to be physically inside the facility to obtain updated information, make decisions, and communicate with other users. Peng and Gala (2014) found that on-premise ERP hinders the decision-making process, whereas investing in cloud-based ERP solves these issues and increases efficiency through mobility. At present, cloud-based ERP innovation has removed these barriers and helped overcome location restrictions. Evidence for this from different perspectives will be discussed in this section.

With regard to patient care, the leader of nursing in home care (Interviewee #1) stated:

> *"It is easier for a staff nurse … she will just take the laptop and go for a home visit … data, forms are in the system. It facilitates the documentation, reads patient information, assessments, medication, sends a message by the 'message center' if she needs a doctor, if she needs an update on medication … the system will notify the doctor about the new message." (Leader of Nursing - Home Care)*

The above response reveals that ERP has put together all patients' records in a single place and made them available remotely to clinicians outside the facility. Thus, it reduces the effort and time taken of physically carrying all the scheduled patients'

files and required forms. In addition, it shortens the time clinicians need to retrieve and review patient records, promptly accelerating assessment and treatment processes during visits and ensuring there is sufficient time for other scheduled patients. Furthermore, mobility allows nurses to contact physicians when necessary to consult and decide on a treatment. In such a case, the system notifies the physician that an urgent update is required at a home visit. This guarantees that an accurate decision is taken, protecting patients' lives. On this point, the director of emergency nursing (Interviewee #3) explained:

> *"Last night, I checked Cerner at around 1:00 AM. I heard a patient waiting for hours directly. I took action. ... I called the director to tell him we cannot wait, move him now ... reviewing the system within two minutes will solve problems that could happen for the patient in the coming hours." (Director of Nursing - Emergency)*

Furthermore, another case was highlighted by the executive director of nursing (Interviewee #5):

> *"Cerner has been integrated with telemedicine. It's like, if a patient in the ambulance ... is suffering from angina pectoris symptoms, they do electrocardiography ... they can share the screen directly with the patient record and then the doctor can advise them to send the patient to the facility that is designated to look after this kind of disease." (Executive Director of Nursing)*

The above quotations illustrate how mobility allows clinical managers to inspect their units and obtain real-time views of their units' conditions. Accordingly, it enables them to advise their subordinates and take rapid action to ensure on-time service delivery for patients, protecting their health, even when managers are off-duty. The second quotation above also illustrates how ERP supports medical techniques—such as telemedicine—which connects staff in an ambulance directly with a physician in a facility, allowing them to communicate data on the patient's condition remotely in real time. This allows the physician and the ambulance staff to make a proactive

decision before the ambulance arrives at the emergency facility, enhancing service delivery.

Those on the finance side agreed with the clinical managers in terms of the utility of mobility. Furthermore, the finance analyst confirmed that HMC is headed in a direction that complies with Qatar National Vision 2030. He (Interviewee #11) added that all users must be connected with one another everywhere and at all times, explaining:

> *"If one facility raises an urgent purchase requisition after working hours [that] needs to be approved by a manager, the moment the user has [submitted] the request, a notification is triggered to the manager … by email. They have three options: approve, reject, [request] more information. You can do this in one click—just imagine how easy your life becomes." (Financial Analyst)*

This response illustrates the changeability and dynamism of the healthcare environment. At any moment, medical facilities can be exposed to a surprise need for items. In such cases, an immediate decision approving the purchase may be required to avoid delays in the delivery of care services. Thus, mobility promotes a safe environment for patient health based on the fact that, as indicated above, the manager responsible can decide on the purchase wherever and whenever.

In summary, improved mobility has elevated healthcare to a higher level, and both groups agreed that it facilitates their work and contributes to patient care. The system provides clinicians with real-time data and connects medical facilities with finance departments, enhancing their collaboration to optimize and accelerate patient care.

In addition, the combination of ERP and business analytics optimizes the decision-making process. In this respect, the executive director of nursing (Interviewee #5) asserted:

> *"We can establish a data dashboard that pulls the data from a data warehouse in [an] automatic fashion … you can see the report for like three years in a few minutes … capture areas for improvement … it visualizes the performance in a better way, which wasn't the case before—everything was paper … you needed to match between many pages to get the information you [needed]." (Executive Director of Nursing).*

Similarly, the director of emergency nursing (Interviewee #3) added:

> *"It gives me the history. Like, I want to know how many patients came to the emergency [department] last month and stayed for more than 20 hours … the system will tell me [that] there are 50 patients waiting for this [amount of] time every day. So, it notifies me, you need to extend your support … increase the size of the emergency waiting area." (Director of Nursing - Emergency)*

This demonstrates that ERP enables clinical managers to obtain a picture of the areas that need improvement instantly and with little effort. It extracts the desired data and converts it into a useful report, thus reserving time for improvement processes and smarter decision making as an alternative to searching and analyzing data. This has led clinical managers to accept ERP as a tool that makes their lives easier. To illustrate this, the above quotation by the director outlines an example regarding the analytics functionality in the emergency department, which allows clinical managers to make a corrective decision and set out a new plan. However, in the same context, the director (Interviewee #3) argued that "*clinical wisdom is required*."

In terms of resource management, one head nurse in critical care (Interviewee #4) commented:

> *"I know how much I consumed from a specific item. I can even analyze data … a certain item's usage is very high, I can say, based on that information … or I am not going to request this item because it is not used." (Head Nurse - Critical Care)*

This illustrates the ability of the ERP to involve clinical managers in managerial mechanisms. The analytics provides them with the information required to maintain

a reasonable level of supplies that satisfies the units' patients' needs and, at the same time, control consumption, consequently reducing waste at the corporate level. Therefore, it empowers clinical managers to contribute to corporate efficiency. Furthermore, regarding HR, the same head nurse (Interviewee #4) addressed ERP at the unit level:

> *"It makes my life easier ... preparing the duty was a headache ... but now, if you go to Oracle ... just fix the duty for a full month or full year ... it is a matter of clicking a button. Only a few adjustments should be done." (Head Nurse - Critical Care)*

Regarding the hospital level, the executive director of nursing (Interviewee #5) added:

> *"If I want to do the leave planning ... I am running a hospital that has 500 nurses, so before ... can you imagine how many pages I needed to review to make sure that I had adequate nurses available every day during the year. Now, it is quite easy. I just make a simple inquiry and I get it in no time." (Executive Director of Nursing)*

Meanwhile, at the corporate level, one assistant director (Interviewee #6) commented:

> *"We produce [a] daily dashboard activity that captures the last 24 hours of daily activities for the entire hospital departments' capacity, demand, utilization, and we present it to the top administration to see whether we are in a position to help other hospitals or whether we [need] help." (Assistant Executive Director - Clinical Support)*

The above quotations reveal the vast differences in HR planning at the unit, hospital, and corporate levels brought about by ERP. As confirmed by the head nurse and executive director, planning for either monthly or yearly duty used to be a difficult process for both units and hospitals. With ERP, it has become much easier and smoother. The intelligence of ERP makes it possible to analyze data upon a clinical manager's request for either planning or adjustments, and the system will promptly come up with a duty plan, which was previously exhausting work. The computational

power of ERP facilitates this and enables clinical managers to effortlessly ensure that they have sufficient staff nurses to maintain an adequate level of care. Furthermore, the analytics appear to promote intra-organizational management given that the responses above suggest that ERP is useful in coordination and cooperation at the corporate level, as well as among hospitals, to overcome shortages. Thus, it guarantees hospital viability in serving patients effectively.

However, despite the success of ERP in medical units, there are still opportunities to improve and integrate certain functions. For example, the executive director of nursing (Interviewee #5) had the following criticism:

> *"Performance appraisal, I think, is an opportunity to improve, which we are discussing now, to be more active. Like, for power forms … rather than using paper … I have to scan the paper, upload, reduce the size, and other technical issues, then submit it. It loses the value of automation." (Executive Director of Nursing)*

The respondent proposed integrating and activating individual performance evaluation processes within ERP, which is expected to speed up the decision-making process as to whether nurses' capabilities allow them to continue working for HMC. This demonstrates that the involvement of clinical managers is an opportunity to enhance and improve the system. ERP has reduced the burden on clinical managers with regard to many responsibilities, strengthening their loyalty and sense of ownership. Hence, they are able to think continuously about areas that need improvement in ERP and communicate them to specialized committees.

From a financial perspective, the interviewees had conflicting judgments. The financial analyst (Interviewee #11) stated that:

> *"For example, if, for a doctor, we want to see how many surgeries he performed in a year … just go to Cerner, access that report, put in his/her parameters. For the employee level, we extract work done by each employee from the system … e.g., we can have a report for each user as to how many invoices they have prepared in a month or how*

many purchase order have been approved by a user in a month or a year." (Financial Analyst)

This quote reveals a financial philosophy in which the respondent perceives the analytical advantage provided by ERP as a tool that assists the finance department in evaluating staff based on how many tasks have been performed instead of how well they have been performed. In this way, ERP allows the finance department to determine a budget, salaries, or rewards based on performance evaluation scores. In addition, the financial analyst (Interviewee #11) highlighted:

They use all their expense data from the ERP solution, patient data from Cerner, and then the costing system to see how much HMC is [spending] per bed [on] treating a patient. So, detailed data from multiple systems are run in a system called [the] patient-level information costing system. (Financial Analyst)

This points out the advantage of integration in the costing department comes from collecting the necessary data from multiple departments and making it available in the costing system. Then, the analytics can transform this data into a useful report on the cost per admitted patient. This can help decision makers in finance to compare budgeted to actual costs. Accordingly, it allows them to predict costs for the subsequent period and assist the budget department in setting out a plan.

As outlined in this section, analytic support assists both groups. For clinical managers, it captures their units' performances and highlights areas needing improvement. In addition, it is helpful for resource management in units and facilities, as well as at the corporate level. However, ERP analytics could still be improved to interact with more functions, such as the individual performance evaluation process. In the finance department, ERP both helps capture employee performance levels based on quantitative information and supports the costing system.

5.2.3. Concluding remarks

To summarize, ERP's features of accessibility, mobility, and analytics have changed life at HMC. Clearly, ERP has enhanced the planning and decision-making processes of MAPs, bringing patient care to a more advanced level. For the most part, these properties are beneficial and valuable for clinical managers in their clinical, managerial, and financial roles. However, they have had a negative impact on the finance professionals in some respects. The clinical managers appeared satisfied with ERP as it saves time and effort enormously. In contrast, despite the positive impact of ERP in finance, the aspect of accessibility was perceived as time-consuming at the administrator level, burdening accountants with the responsibility of facilitating the work of others. The next subsection will discuss the accountability and control functions.

5.3. Accountability and control

The second main area is related to accountability and control. Control is a significant aspect of management accounting. After setting an organization's plans, management needs a solid and reliable internal control system to ensure the plans follow the correct direction and meet the expectations of the management body. Internal control systems are composed of five components: control environment, risk assessment, control activities, information, and communication and monitoring (Bodnar & Hopwood, 2013). This subsection outlines how these elements are embedded in ERP, as well as the powers and capabilities this technology has to support the control function. In addition, ERP contributes to accountability by streamlining organizational activities and defining each user's role. Hence, users are aware of and accountable for their responsibilities, and the supervising body is aware of what each user has to accomplish and can alert users and supervisors to any

deviations. Accordingly, the capacity of ERP for control may be of interest to both supervisors and the users who execute the tasks. In other words, ERP enables users to perform their tasks in the right way, while empowering supervisors by providing continuous monitoring and indications of user performance. This subsection is devoted to discussing accountability and control MAPs, considering the ERP characteristics grouped into the four subthemes shown in Table 4.

Table 4. Summary of the findings on the second function

Function 2: Accountability and Control	**Clinicians (Patients' Care)**	**Clinicians (Managerial Role)**	**Accountants**
Accessibility	○ Accountability to patients: ⇒ Monitoring the units (patients and staff) ⇒ Staff self-regulated ⇒ On-time services ⇒ Protect patients ⇒ Burden monitoring in pharmacy ⇒ More accountability to improve performance	○ Accountability to corporate: ⇒ Track staff commitment or transfer authority ⇒ Monitor and control plan for resources ○ Accountability to staff: ⇒ Less time and effort ⇒ Accelerate and enhance staff service quality	○ Accountability to staff: ⇒ Real-time data between departments ⇒ Enhance their services ○ Accountability to corporate: ⇒ Hard transformation ⇒ More responsibilities for system administrators ⇒ Less effort to control budget plan ⇒ Verification: more accuracy, less errors ○ Accountability to governmental entities: ⇒ Availability
Analytics and Mobility	○ Accountability to patients: ⇒ Alarm to complete patient records ⇒ Alarm for rapid interference ⇒ Alarm to reduce medication errors ⇒ Remote access protects patient data and enables more transparency ⇒ Rapid interference via remote access ⇒ Patient complaints ○ Accountability to staff:	○ Remote access perceived positively and negatively: ⇒ Authorization and power level varies	○ Accountability to governmental entities: ⇒ Automated reporting ⇒ Trigger shortage ○ Accountability to corporate: ⇒ Cost management ⇒ Variance analysis ⇒ Ensure sufficient supply levels for medical facilities ○ Accountability to staff: ⇒ Real-time data ⇒ Limited access ○ Accountability toward society: ⇒ Role in COVID-19

Function 2: Accountability and Control	Clinicians (Patients' Care)	Clinicians (Managerial Role)	Accountants
	⇒ Remote access is health-promoting		
Skills and Standardization	○ Accountability to patients: ⇒ Challenge narrative documentation ⇒ Skills variances ⇒ Time-consuming for patients	○ Accountability to corporate: ⇒ Learn to affect performance evaluation decisions	○ Accountability to patients: ⇒ Time consumption/skills affect the delivery to medical facility ○ Accountability to corporate: ⇒ Regulate data communication
Security and Privacy	○ Accountability to patients: ⇒ Patient privacy protection	○ Accountability to corporate: ⇒ Burden responsibility to increase staff awareness. (insider risk) ⇒ Costly and time-consuming	○ Accountability to corporate: ⇒ More responsibility (outsider risk) ⇒ Inaccurate ⇒ More concentration required ○ Control procedures highlight errors and ensure efficiency ○ Accountability to staff: ⇒ employee privacy

5.3.1. Accessibility

The first component of the internal control process is the control environment, which encompasses several elements, policies, and procedures (Bodnar & Hopwood, 2013). One of these procedures is supervision, which is crucial in observing employee performance to ensure that employees act in the organization's interests. Concerning patient care, access to patient updates and histories inside the department improves HR procedures, such as supervision. The director of emergency nursing (Interviewee #3) revealed that:

> *"The head nurse has a screen where he can review all the patients' plans and history—he knows what is going on for the patients right now … after one day or after two or three hours, he can make sure of that nurse's performance without delay." (Director of Nursing - Emergency).*

This indicates that ERP enables clinical managers to observe patient status, allowing them to plan what an admitted patient will need within the coming hours or even days, as well as to oversee how staff nurses perform according to that plan. In other words, accessibility allows clinical managers to both practice planning during the admission period and control the direction of that plan. This demonstrates how planning and control MAPs are linked through ERP. Furthermore, Interviewee #3 added:

> *I am not going to ask what this patient is doing in this unit—no, the question has changed. Nowadays, I am asking when this patient will see [their] paper for a CT [Computed Tomography] scan ... where is the patient's CT scan report? The leader is [now] coming to the unit at 8:00 AM and has a different idea than before; this gives them the feeling that we know everything. (Director of Nursing - Emergency).*

This quotation describes a control practice from the clinical manager's side and accountability from the staff nurse's side. ERP allows clinical managers to monitor patient status and ensure that staff nurses proceed with the expected level of performance on a daily basis. To clarify, this greatly improves the role of clinical managers. Previously, they were required to manually review patient records and ask their subordinates for details and updates on all the patients in the unit. Based on these reviews, the clinical managers would then establish a unit plan and assign responsibilities to their staff. Now, all the required data is accessible in ERP, so they can immediately begin their duty of scanning patient status and services, as well as the services left to provide according to the plan. Thus, their subordinates are also more aware of their responsibilities and will be accountable for them. Overall, ERP forces staff nurses to self-regulate and be more responsible for accomplishing what is expected from them on time.

Although this integration seems to benefit clinical managers, it was perceived

as a disadvantage by the pharmacy supervisor (Interviewee #8), who complained that:

> *"It connects different parts—we need to … double check between different users … more detailed daily monitoring … was there any wrong selection? Because this new system has a lot of options … users may get confused and select wrong or different details during dispensing. … It is a huge workload." (Pharmacy Supervisor)*

ERP enables effective monitoring through integration because a large amount of data on several users and transactions is available. This should enhance the supervision of user performance and allow for the easy detection of any deviation that may negatively affect a patient's life. In contrast, from the pharmacy supervisor's point of view, ERP provides the dispensers with many options that may confuse them. Thus, it overburdens the supervisor's monitoring obligations to protect patients.

From an administrative perspective, in some cases, a staff nurse is sent to another facility, but the clinical manager still needs to oversee that nurse's commitment despite not being able to physically observe them. In this regard, the head nurse in critical care (Interviewee #4) confirmed that:

> *"If I have a staff [member] who went to another facility for a certain period of time for a certain reason, I can track [their] absence or … performance on Oracle. Moreover, I can even transfer the authority [over] this staff to another head nurse." (Head Nurse - Critical Care)*

Therefore, ERP assists clinical managers in the supervision process, as seamless integration bridges the gaps within the organization, improving communication. Accordingly, it provides control functionality to ensure nurses' commitment and performance, even when they are outside the facility.

Another element of the control environment is the dual control procedure. In this regard, the leader of nursing in home care (Interviewee #1) stated:

> *"The employee will request a leave. Then I will approve it and get a second approval from HR to confirm … after they come back from the leave, they will upload the return, and again, I will approve it. In*

case of sick leave, we have a staff clinic. I would receive [a] notification from the doctor if someone [went on] sick leave." (Leader of Nursing - Home Care).

This response highlights the benefits of internal communication on clinicians' administrative role. ERP connects clinical managers with their subordinates from one side to facilitate nurse requests, such as leaves and returns. Then, it ties together two distinct facilities: medicine (home care) and administration (HR). ERP reduces the time and effort necessary from these three parties as it provides a substitute for their physical presence. It thus provides dual control over approval transactions, allowing two supervising members to oversee and verify the same documents, which increases accuracy and reduces errors. The executive director of nursing (Interviewee #5) confirmed that "*even at home, maybe in five minutes, you [can] get whatever you want. Now, it is completed in an easier way, smoothly.*" *" (Executive Director of Nursing).* In the same context, the director of emergency nursing (Interviewee #3) commented:

"At maximum, it will take two to three hours to have [the] ticket in hand. So, what happened in two to three weeks before now happens within hours or at maximum within the next shift. You can compare the amount of stress that happened before." (Director of Nursing-Emergency)

Thus, regarding the service quality that HMC provides to its employees, staff nurses previously had to wait for a longer period of time; because the process included paperwork, the request papers traveled around the organization and may have been mistaken, rejected, or even lost during the journey, putting the staff under pressure. This feeling of being under pressure was communicated among the unit's team, which could affect their performance, potentially influencing patient care or threatening patient health. The responses above show that staff nurses are pleased with the new service channel through ERP. It provides them with transparent, real-time updates

regarding their requests, which positively affects their performance in the unit, leading to less pressure and greater concentration on patient care. As ERP accelerates service delivery for the staff, it helps HMC improve its accountability to employees. Similarly, the HR accountant (Interviewee #9) agreed:

> *"Any request, such as a loan, housing, leaves, letter request, those are very fast and immediate. You will have up-to-date information about the request ... once there is an update, you will receive an email automatically that the request has been completed ... there is transparency." (Accountant – HR)*

The above quotation describes the improvement in employee services, showing they are aware that their inquiries are no longer time-consuming. Once they are answered, ERP will notify the employee. ERP logic streamlines the transaction and provides real-time information. Furthermore, it enhances the consciousness of responsibility among users, who understand that ERP will not cause any delays. Thus, users can be held responsible for delays in performing their work. Accordingly, ERP makes users more accountable since the processes become more transparent, and any undesired consequences are the responsibility of the user performing the task. In addition, audit trail policies exist within ERP, increasing the ownership of work, leading to greater accountability, integrity, and accuracy. In the same way, the financial analyst (Interviewee #11) stated:

> *"They go for training. ... Now, as an employee, it is the responsibility of HR to pay them on time and maintain all their information ... the employee information is available to the accounts payable team. Once they get confirmation from HR, they will process the payment." (Financial Analyst)*

This response describes the case of employees who go on a training course outside the organization, in which case there is no attendance data that can be used to pay them during this period. Therefore, it is the responsibility of HR to communicate

information on these employees to the finance department to confirm payment for control purposes. Thus, ERP facilitates the communication of information between finance and HR in real time, smoothing the discharge of their accountability to their employees.

Concerning the role of clinical managers in finance, the executive director (Interviewee #5) highlighted the following aspect:

> *"Because we look at the operational cost … when I receive that report, I need to match it with the activity volume. Sometimes, it doesn't match the number of patients, which triggers a notice for the unit's manager: 'Why did you spend this much [on] X material, while the number of patients was similar to the previous quarter?' … so, I need a reasonable explanation for that increase." (Executive Director)*

This illustrates the duality of the clinical manager's role. Despite the priority of helping patients, they still have to consider efficiency in the use of supplies. Thus, availability acts as a control activity. The clinical manager receives the operational cost report quarterly, allowing them to benchmark the budgeted number of consumable items to the actual usage level. The number of patients served is compared with the patient load of the previous quarter and against supply volume. Thus, if there is any deviation from that budget or level in the unit, the unit manager must provide a justification to discharge their accountability for the deviation.

In the same context, the financial analyst (Interviewee #11) commented:

> *"When a department requests a purchase, the system will tell you, you don't have enough money to buy—it gives them a message or warning that … the request can be rejected. In HMC, its thousands of PCR [Polymerase Chain Reaction test] in a month, I am not sure … on a daily basis, more than XX purchase orders." (Financial Analyst)*

An organization with effective management accounting must establish a solid internal control system, including control activities that ensure plans proceed in the

correct direction. The above response shows that ERP will inform the department immediately if they exceed the budgeted amount and that their order might be refused as a result. This control tool increases department managers' awareness and involves them in management mechanisms, helping them to manage their units more efficiently. Moreover, it appears to reduce the burden on the finance department of overseeing large volumes of orders. Alternatively, ERP works as an alarm to control the plan and prevent any deviation.

In addition, those on the finance side indicated that ERP is a verification tool. The financial analyst (Interviewee #11) stated:

> *"If an employee has a paper that [they] paid money to HMC for a service. ... It is only on one line, and it could be lost ... but when you have an IT solution, like ERP, just put in the employee's ID ... when this employee was paid, for what purpose, was it validated, verified, approved, was it paid for by an HMC bank account." (Financial Analyst)*

An organization with a strong accounting information system should have effective accounting controls, including adequate documents and records (Bodnar & Hopwood, 2013). The above response highlights that ERP supports the internal control process, providing sufficient evidence regarding all the steps that a transaction has gone through. Accordingly, it protects clients' rights by having all their payment data available in the database, meaning that accountants can verify it using the system. It also facilitates the monitoring process; in particular, through the audit trail, it will contact the person responsible if there has been an error. Furthermore, ERP helps HMC deal with third parties who are not integrated or related to the corporation. In this regard, the HR accountant (Interviewee #9) stated that:

> *"We are processing the invoices after an employee is active in HMC, so I have to make sure [that] the information that I receive from the agencies, like the basic salary and the names are the same—so, I verify [this] data from Oracle ... [if] I can't match the data ... then*

the invoice will not proceed and be approved." (Accountant-HR)

ERP is valuable even when HMC is involved in a contract with a third party not handled by the corporation. For example, they deal with recruitment agencies, which supply them with medical and non-medical employees in exchange for a fee. According to the above response, the accountant's job is to prepare invoices with the amount that will be paid to the agency. Records and documentation available from ERP are used as evidence or references that the accountants can use to verify the information used to prepare the invoices. Although these invoices are prepared manually using data from Oracle, the accountant (Interviewee #9) confirmed that after she finalizes the invoices, two auditors go through and verify them. Hence, ERP enhances the monitoring and auditing processes, ensuring accuracy and reducing errors. However, in terms of control, availability appears to be a complicating factor from the financial analyst's (Interviewee #11) point of view:

> *"It is always complicated for me because at the end of the day, anything bad … the responsibility is taken by the admin system. If you are a business user it is okay … in the morning, I go through all the integration that I am responsible for. I check that whatever data is supposed to come to the system has come, whatever I am supposed to export to other systems is done. If there are any errors, how to fix these." (Financial Analyst)*

This contrasts with the views of most clinical managers, who are satisfied with the utility of accessibility in terms of control. Furthermore, it also conflicts with the accountant's views (Interviewee #9). It appears this accessibility overburdens those in higher positions, such as system administrators, who must ensure data availability for other users, as it makes them accountable for any deviations.

Regarding the accountability of staff toward HMC, the assistant executive director of clinical support (Interviewee #6) commented:

"I would just say it is different. It is the same old appraisal sheet, but

> *staff submit it through the system. In the past, they had it in a file they could always access in the cupboard in the head nurse's office; now, they can access it on their computer." (Assistant Executive Director - Clinical Support).*

This conflicts with the view of the executive director of nursing, who expressed dissatisfaction with the current performance evaluation process still being conducted manually. In contrast, Interviewee #6 suggested that the accessibility of the records allows staff nurses to revise their evaluations at any point in time, as confirmed by the leader of nursing (Interviewee #1). In fact, it is even available even on users' mobiles via a mobile application. This increases their sense of ownership, which in turn encourages them to reach an advanced performance level, especially with the possibility of rewards or punishments. In other words, it makes them more accountable for improving their own performances.

From a finance perspective, the financial analyst (Interviewee #11) complained:

> *"When you migrate from a legacy system to a new system, you need to make sure the data you are migrating to [the] new system [is] correct ... your closing balance should always [be] equal to the opening balance; you have to do a comparison ... a data analysis ... whatever was there is [also] posted to ERP. If that doesn't happen, problems start because whatever transaction you do in [the] future is going to create further problems for you." (Financial Analyst)*

The culture of ERP is based on providing accurate and reliable data. Therefore, to foster belief and build trust in users, the system must rest on a solid foundation. At the beginning of the project, those on the finance side had the responsibility of transferring all the information and records from the legacy system, which included stand-alone systems and paper records, to ERP. As the financial analyst (Interviewee #11) stated, this overwhelmed the finance department because any one mistake could have created a series of problems, increasing the accountability of the finance professionals toward HMC at that time.

However, ERP is functional for extra-organizational relationships, as the financial analyst (Interviewee #11) confirmed:

> *"The biggest responsibility as [an] FIS [Financial Information System] is to make the data readily available. … Sometimes at two or three o'clock, we suddenly get an email from the Ministry of Finance [MOF] or [MOPH]: We need this set of data. It is possible that if that data is available in the system where I can extract it, I can prepare it in the required format and time." (Financial Analyst)*

He went on to explain:

> *"We report to the MOF daily all HMC's payments, revenues, and expenses. It runs every day and night. It is a fully automated system … Similarly, with public health, we transfer all our budgeted data and yearly expenditure that we get from the Ministry and have to post it onto the MOPH's account. In addition, we send monthly expenditures." (Financial Analyst)*

ERP is connected to the information systems of other ministries, such as the MOF and the MOPH, and HMC is accountable for providing them with reports regularly. ERP makes the data from all parties readily available, and it can be easily generated from a certain place in a timely manner, which is important given the ministries may ask for a report at any time of the day. ERP can also be programmed to send the required reports automatically at a designated time. Therefore, it enables HMC to fulfill its accountability to other governmental entities effectively, improving the monitoring by governmental authorities and in turn increasing the sense of accountability within HMC. In this way, it protects the population's health and saves the country's resources.

In summary, accessibility reinforces control and accountability functions interdependently. The findings of the interviews revealed several elements of an effective internal control system implemented implicitly through ERP—such as HR procedures—reflecting a line of control that includes segregation of duty, supervision,

control duality, and audit trails. In addition, other components include the holding of adequate records and the communication of information. As a result, ERP improves accountability toward patients, staff, HMC, governmental authorities, and the community.

5.3.2. Analytics and mobility

In the matter of patient care, analytics allow clinical managers to capture an entire unit's performance, helping govern the performance of other lower-level managers. In this regard, the executive director of nursing (Interviewee #5) stated that:

> *"In kidney dialysis … we need to accommodate X number of patients. … If the nurses are slow … to dialyze the patient in four hours … this puts following patients at risk … here, I hold the unit manager [to] account to improve the performance of [their] unit. … So, now the system gives me timely reports. (Executive Director of Nursing)."*

Although performance evaluation in HMC is officially conducted quarterly, ERP enables medical managers to investigate performance daily, generating real-time reports instead of quarterly performance evaluation results that are considered outdated by the time they are generated, especially when this data is related to a patient's life. Therefore, it boosts clinical managers' sense of responsibility, as their units are under continuous monitoring by those in higher positions, fostering accountability with regard to patient health.

In the business field, the amount, quality, and timeliness of the available data affects decisions, which in turn affects business profitability. In addition, accounting records and documents are essential to validate transactions and protect client rights. Similarly, in healthcare, the data in patient records plays a vital role in the quality of healthcare services, affecting patient health. In this context, the director of emergency nursing (Interviewee #3) highlighted:

> *"Directly, Cerner will update, remind, and [notify] me that this data should be filled [in] for this patient, so I will be sure in this way that all data is filled [in] for this patient … so, nothing will be forgotten." (Director of Nursing - Emergency)*

This shows that ERP intelligence and programming assists nurses/physicians in creating complete documentation for patients, as ERP works as a notification device, reminding them if they have forgotten to fill in a field. Hence, ERP serves as a control tool that automates the supervision process. Monitoring documentation has become less people-involved as ERP provides real-time inspection and will not save an incomplete patient record. Therefore, it ensures that completely updated information on a patient's condition is available on their record, protecting the patient's health, particularly if there is a sudden incident. Similarly, the director of emergency nursing (Interviewee #3) added, "*If any change is happening to the patient, Cerner will [notify] me [to] take care of this patient, [that] there is something going on.*" *(Director of Nursing - Emergency).* Thus, integration generates updated and timely data flows for Cerner, which is at the heart of patient records coming from several parties, such as the lab, surgery department, integrated monitors/machines, and/or a clinician in the same facility. Therefore, the director in the emergency department would receive a timely notification if a patient admitted there becomes critically ill. This continuous monitoring and on-time notifications place the patients in a safe environment where healthcare providers can intervene quickly at the right time.

The medication process proceeds through various steps to reduce medication error. According to the IHI (as cited by Federico, n.d. para.1), one should "use the 'five rights': the right patient, the right drug, the right dose, the right route, and the right time." In this respect, the director of emergency nursing (Interviewee #3) highlighted:

> *"Medication should be scanned … if it is wrong, it directly [alerts] you; if you scanned a correct medication and you put the wrong dose,*

it [alerts] you … when the verification is finished, it reminds you that the medication is finished, and it is the time for the second medication." (Director of Nursing - Emergency)

Thus, ERP helps clinicians to protect patient lives, providing auto-supervision. After the medication is prescribed and approved by a physician, the staff nurse will not be able to deliver the dose unless they verify the medication with the system. They have to scan the medication first, and ERP confirms whether this is the exact medication for this particular patient, as well as whether it is the correct dose. In addition, it will notify the staff nurse about the next dose date/time, which is consistent with the five rights stated by the IHI.

From the perspective of finance, the financial analyst (Interviewee #11) stated:

"ERP is integrated with systems like Cerner, Hyperion, MOF, and MOPH. It runs based on their designated time. … Like, with the MOF, all revenue and expenses flow every day to the MOF's system automatically; in case there is a failure or error, we will get a modification email trigger." (Financial Analyst)

This response reveals the integration at the micro level, including the finance divisions, and that ERP also integrates with other medical applications, such as Cerner. In addition, ERP provides HMC integration at the macro level by providing a connection with other ministries, such as the MOF and the MOPH. Furthermore, it automates reporting—which is useful for controlling resources even at the macro level—as it is programmed to provide information for the ministries regularly, which discharges HMC's accountability. Moreover, ERP will notify the finance department of any issues.

At the corporate/micro level, the supply chain manager (Interviewee #10) asserted:

"Every Thursday, we do cycle counts on a sample. Oracle chooses like 50 items, and the staff counters have to count them. Then, we

compare it with the number that Oracle said should be on the shelf … that always keeps us in check. And if there is variance, I get an email saying there is a variance in these items." (Supply Chain Manager)

This indicates ERP's intelligence in controlling the inventory level, as it alerts warehouse employees to regularly identify any variance between the stock on the actual shelves and the available quantity in the virtual ones. ERP selects different shelves every week rather than relying on human memory, which ensures that all shelves are covered. Then, if a difference exists after inventory variance analysis is conducted, a notification will be sent automatically by Oracle to the warehouse manager, prompting an investigation. The supply chain manager (Interviewee #10) added:

"You can generate a report for anything … about fast or slow-moving items, group items into categories … which items are consumed more, item cost, value … cost and profit are not our motive—we do not look at that much, but we still have to pay attention … there are some surgical instruments [that] are very tiny but cost XX thousands [of] QR [Qatari Riyal] per piece." (Supply Chain manager)

Analytics produce valuable reports that enable warehouse employees to manage their operations. In particular, a report is made to determine the status of supplies that are always in demand by medical facilities, enabling them to maintain a sufficient level that meets the facilities' needs. Although the primary goal of HMC as a governmental agency is to provide healthcare services to the public, cost management is vital as they are accountable for protecting the country's resources. The above quotation indicates that ERP provides continuous monitoring of supply consumption. Hence, it leads to continuous cost management over time. Notably, the consumption of expensive items might lead controllers to track cost drivers.

With regard to mobility, the nursing leader in home care (Interviewee #1) happily commented:

"No paperwork, no files to carry during home visits … paperwork

damages the files, especially for us as a community—the nurses go and come back [from] home visits … something dropped on the file or dirt got on it at a patient's home. It happened a lot." (Leader of Nursing Home Care)

This confirms that ERP protects patient records, with mobility playing a role in control, safeguarding the records. As a result, it protects patients and enhances the quality of healthcare services as any lost data could put patients at risk. In addition, she (Interviewee #1) added:

"The patient's condition can easily be shared with the parents, and they can read it easily during a home visit from a laptop, and they are happy sharing the data … only the doctors can share." (Leader of Nursing Home Care)

This shows that ERP satisfies patients and their families as they receive continuous updates and follow ups on patients' health conditions in the presence of a physician only, protecting their privacy. Thus, ERP enhances transparency for patients and their families regarding health situations, medication taken, and assessments. In general, it also demonstrates the quality of care, with updated data—such as lab results—available at every visit, reflecting the quality of services provided at the facility. Thus, the community now has greater awareness regarding service quality. However, according to the leader of nursing in home care (Interviewee #1), "*If you surveyed the patients about the system, they would criticize it, saying staff have [their] eyes on the system [and] not on the patient.*" This indicates that patients may be unhappy since time and attention is focused on the screen more than on their health or the services they are receiving. However, ERP also improves the health of staff, as stated by the leader of nursing in home care (Interviewee #1):

"The system is really helping staff. We have 2,000+ patients. Just imagine, the nurse will visit five patients, and she has this number of files, and she needs another bag to carry the consumable items. It is physically healthier for her." (Leader of Nursing Home Care)

The above response confirms that remote access to data relieves the issue of physically carrying patient records. Thus, ERP saves the time that was previously wasted on the transfer of the files. Moreover, it protects staff nurses' health and wellbeing, which is important given that any organization is accountable to its employees. Moreover, the financial analyst (Interviewee #11) happily agreed that:

> *"It is an app deployed on the internet ... wherever [they are], they can log in, apply for leave, vacation, check pay slips, request certificates ... certain systems work within HMC's network only, and others work everywhere depending upon the [type] of security it has ... only certain functions are available due to data security." (Financial Analyst)*

Mobility facilitates employees' work and personal lives. ERP has also brought transparency to processes and built greater trust, since data is updated in a timely manner and accessible everywhere at any time. However, the above quotation by the financial analyst confirms that remote access is limited to certain services as a means of controlling access and protecting data. The leader of nursing in home care (Interviewee #1) unhappily added, "*There are some options in the system I cannot use outside the corporation, like purchase/supply chain management.*" *(Leader of Nursing - Home Care).* This shows that the system's mobility hinders internal requests for supplies from the warehouse and placing purchase orders, which she considered an obstacle that should be adjusted. However, remote access also differs based on the authentication level, the sensitivity of the department, and the necessity to the unit, as was confirmed by other interviewees. For example, the leader of nursing in home care (Interviewee #1) confirmed that she could not access patients' records in her own home, while the director of nursing in the emergency department (Interviewee #3) asserted that Cerner is accessible to him 24 hours a day, even when at home.

With regard to the responsibility of HMC toward society, the financial analyst

(Interviewee #11) asserted:

> *"During COVID-19, many employees had to work from home, and the IT team moved swiftly to expand the remote access capacity for [the] seamless delivery of support services, as HMC is crucial to healthcare … without effective support services, patient care will be impacted." (Financial Analyst)*

This confirms that, during the pandemic, the IT department worked effectively to expand the capacity for remote access to ERP, as there were times when employees could not attend HMC due to either area restrictions or precautionary measures. This mobility allowed users from various areas of specialization to connect with one another from different locations to fulfill their responsibilities. It thus enabled HMC to function during this critical time, which was particularly important since it is accountable to the community as a whole.

In summary, analytics provide HMC with high levels of control that ensure complete data for patient records and reduce errors. In addition, they guarantee timely reporting and assist in cost management. Therefore, analytics help in fulfilling accountability toward patients, HMC, governments, and society. In addition, the associated mobility is functional and has significantly enhanced healthcare services. It removes barriers and provides access from outside HMC's facilities for both medical and finance professionals; however, control procedures are in place to prevent undesired access. Mobility plays a vital role in protecting patient data and staff health and provides transparent data to employees concerning the accountability of HMC to its patients and staff. Furthermore, mobility has played a significant role during COVID-19, helping HMC maintain a good level of service, which is highly important given the organization is accountable for the population's health.

5.3.3. Skills and standardization

Documentation is essential in accounting to provide evidence regarding transactions. A solid internal control system should have adequate records and documents that provide information and allow users to communicate with each other. In addition, it discharges users of their accountability in carrying out transactions and plays a role in the auditing process. Similarly, documentation is essential for the medical profession, since it provides evidence on patient assessments, changes in patients' clinical conditions, and updates. This information will be then communicated to several parties or departments given that a treatment plan is a multidisciplinary decision that—depending on a patient's status—includes nurses, physicians, pharmacists, and labs. Accordingly, documentation should be clear and complete. The discussion on this subtheme takes two aspects of ERP that might affect documentation into account: standardization and skills.

Despite the utility of ERP standardization to streamline the organization, from a medical perspective, the nursing leader in home care (Interviewee #1) stated:

> *"We tried to adapt to the original version, but it did not fit because we [needed] more features that help our tasks. Our work has continuous improvements and new projects … that lead to [adding] new information and change." (Leader of Nursing Home Care)*

One principle of HMC's Nursing and Midwifery Strategy (2019) is to provide evidence-based healthcare services. This requires continuous research, projects, and learning. The acceleration in knowledge and continuous development in the medical field encourages countries to adapt to changes. Nowadays, both quality and enhancement in public services have become mandatory. This is part of the NPM process, as globalization has increased public awareness of events around the world. As a result, these factors continuously encourage improvements and changes in care services, which increases the amount of documentation, as stated in the above quote.

Therefore, standardization does not satisfy the clinical field, and changes and customization are required that correspond with changes in treatment procedures. As the executive director of nursing (Interviewee #5) added:

> *"There was always [a] work-around when you didn't have a field to document something … power forms give you specific fields and a small margin to write narratives … clinical information cannot be standardized, and everything matters—that's why we need continuous updates. … This is one of the biggest challenges." (Executive Director of Nursing)*

This shows that paper forms are easier to use for documentation because they can be easily manipulated on a case-by-case basis. In contrast, ERP power forms are structured and standardized for all facilities, which challenges care providers when they do not fit the treatment plan. The problem here lies in the need for more space to document critical clinical details as treatment plans vary from one patient to another depending on a patient's condition. When data is related to patient health, every bit of information is essential, and any shortage or delay affects patients' lives. HMC's project management and top management support are effective, as confirmed by all interviewees. However, the executive director of nursing (Interviewee #5) commented, "*You cannot change the form without [making] enterprise changes, which is not [an] easy process*." *(Executive Director of Nursing).* This indicates the difficulty of the customization process in HMC. In addition to the fact that customization is costly, it is a complex matter, since HMC is a large corporation. Any changes in the power forms have to be implemented in all hospitals, making customization a slow process. Most of the interviewees referred to this as a disadvantage of ERP.

From a finance perspective, the financial analyst (Interviewee #11) stated:

> *"The objective is to streamline the business where … everybody is connected. The main objective is that the data [is] available, trusted, and genuine. … It is a standardized system you can integrate with multiple systems … you can get data from third-party systems."*

(Financial Analyst)

He went on to say that "*no business is standardized. Each has a set of data requirements. … In implementation, they provide all [the] requirements to the team for customization.*" *(Financial Analyst).* The above responses indicate different views within the finance department regarding standardization. On one hand, it is believed that standardization is advantageous for a large organization. It regulates the connections between different types of businesses and bridges any gap. Standardization includes the systemization of the real-time availability and quality of data, which is required to finalize transactions without delay. On the other hand, the finance professionals agreed with the clinical managers that the reporting method cannot be standardized, and customization is thus required to satisfy the needs of different business types.

Another issue with ERP is the skills required to deal with the technology. This is a challenge that users might experience generally when shifting to a new information system. Users who have worked manually for a long time may be unable to familiarize themselves with ERP within a short timeframe. The interviewees asserted that frontline users in particular have had trouble with the system, since it changed how they document data. Such organizational change requires high levels of support from top management so that it can be handled effectively. In this regard, the executive director of nursing (Interviewee #5) commented:

> *"Not everyone will learn at the same pace; until now, some still use one finger for typing … you know how it looks! It takes a long time, so this is a difficulty with technology, but there is continuous education to bring them up to the required level." (Executive Director of Nursing)*

This confirms that top management provides support and encouragement for continuous learning and training. However, the problem lies with the users

themselves, since individuals have different learning capabilities, especially those who are not used to computer-based typing; it is a skill that requires time to hone. On the same point, the leader of nursing in home care (Interviewee #1) said:

> *"They felt paperwork was easier for them … not everyone [had] the skills to document quickly. … At the beginning, they didn't know how to do it directly, and some of them they were doing it at the office after they came back!" (Leader of Nursing - Home Care)*

Further, she (Interviewee #1) added:

> *"[They took] a long time, 45–60 minutes … patients' relatives complained [so] we asked them to finish the documentation in the car before they [left] … [then] patients' neighbors [complained] about the hospital's car." (Leader of Nursing - Home Care).*

This response shows that while staff nurses attempted to keep pace with ERP at the beginning of the transition, they remained convinced that paper-based documentation was smoother and required less effort than computer-based documentation. This included a kind of resistance as they decided to solve the dilemma by delaying completing the documentation until they reached the office. Hence, it seems they did not realize the philosophy of ERP, which aims to provide real-time data based on the availability of patients' histories. In addition, documentation puts staff nurses under pressure from different parties; it consumes time, which is unacceptable for patients' families as they perceive a lack of balance between the time taken for assessment and for documentation. The nursing leader (Interviewee #1) also revealed that staff nurses are satisfied with ERP in some respects, yet they are troubled by the documentation during home visits and request that this burden be reduced while they have other ongoing projects and programs that force them to do detailed documentation.

Similarly, in the warehouse, the supply chain manager (Interviewee #10) confirmed:

> *"[For] every transaction, you have to go through a series of clicks and checks. So, at the [same] time, clinical departments are waiting for items, of all the processes in the warehouse, such as packing, offloading, sorting, the thing that consumes the most time is Oracle [over] any other process." (Supply Chain Manager)*

This quotation adds to the discussion on skills, suggesting that Oracle is time-consuming from an accountant's perspective and that it impedes the responsibility of fulfillment to the medical facilities. Thus, it appears to affect care services negatively due to delays in the delivery of supplies. However, it also reflects the importance of experience; with more time and training, users will become more familiar with the system.

In addition, the head nurse (Interviewee #2) stated, "*It's part of [the] evaluation, if a staff [member] is more familiar with it … for sure, [they] will do [their] job much better … and get a good score in [their] appraisal.*" *(Head Nurse).* This highlights that the capability of staff nurses to use ERP influences managers' evaluations of them, affecting final performance evaluation scores either positively or negatively. This increases the sense of responsibility to learn and enhance this skill, which is then reflected in performance and, consequently, in care quality.

To summarize, documentation is a vital part of the internal control system as it provides evidence on services. Notably, on the medical side of HMC, the existence of satisfactory, real-time data positively affects both patients' lives and the services provided. Conversely, a data shortage may threaten patients' lives. However, data availability is affected by two key properties of ERP: standardization and the required skills. The level of standardization has not satisfied clinicians due to variations in patients' situations and may hinder service providers in updating vital data. This affects the documentation element in the control system and restricts users from being successfully accountable for patient health. Both groups found the skills required to

use the system challenging; ERP depends on users' capabilities to interact with the technology and requires the rapid learning of new skills. Hence, when users are familiar with ERP, this may support control and discharge the users of accountability toward HMC and its patients. However, it is challenging when users have difficulties with computers and are slow in learning related skills. This negatively affects the documentation and leads to the loss of valuable real-time data, which negatively affects users' accountability toward HMC and its patients.

5.3.4. Security and privacy

Although accessibility makes the lives of medical professionals easier, robust controls and procedures should be implemented to protect the data. This section discusses how ERP assists and/or threatens data security and privacy. Peng and Gala (2014) elucidated that data privacy involves ensuring and maintaining the entity's confidentiality and protecting data from being disclosed to unauthorized individuals or organizations, while data security involves protecting the data from unauthorized access.

In this regard, one of the head nurses (Interviewee #2) commented:

> *"Despite access being easy from everywhere, this puts us [in] a critical situation and [under] pressure to monitor the system … the IT team sends messages … and part of our responsibility is to give responsibility to each staff [member] that this information shouldn't be communicated outside or to a non-required entity." (Head Nurse)*

This illustrates a negative aspect of availability, namely, that data might be communicated outside the facility. It increases the responsibility placed on the IT department to frequently remind users not to share data. Additionally, it further increases clinical leaders' responsibility to raise their subordinates' level of awareness regarding protecting the privacy of patient records. Nevertheless, there is an effective

control practice in HMC that creates a sense of integrity among users and forms a strong control environment. Overall, the above quotation reveals a solid internal control process according to which there is information available; it is regularly repeated and communicated, which is helpful in bridging the security gap.

The financial analyst (Interviewee #11) asserted:

> *"A lot of security concerns how you control the data, how data is visible to people that you have to control, yes … some challenges come, like cyber-attacks, but the benefits always outweigh them … nothing can be perfect." (Financial Analyst)*

However, this conflicted with the head nurse's (Interviewee #2) opinion, given that it is their responsibility to protect patient records from insiders who might communicate this data to outsiders. From a finance perspective, the financial analyst (Interviewee #11) suggested that outsiders threaten the security of corporate data. In addition, he suggested that despite being challenging and further increasing their responsibilities, the advantages outweigh the drawbacks.

Referring to the option to change information, the leader of nursing in home care (Interviewee #1) commented:

> *"Each encounter created will cost the corporation. Just imagine that each encounter is doubled or tripled … we [tell] the committee to remove [the] item, and it must be checked that [it] is empty. It is a long [process] and not easy to delete a record." (Leader of Nursing - Home Care)*

Despite her medical background, here she was referring to the cost of duplication. In addition, she expressed her dissatisfaction that users are not authorized to change or delete information. She perceived this control as time-consuming and a deficit that should be upgraded. In contrast, the HR accountant (Interviewee #9) stated that "*the challenge [is] data entry, as it is entered manually, and if mistakes are made, there are no undo or delete options to ensure strict internal controls.*" (*Accountant –*

HR). This shows that the accountant realizes that the absence of a change or delete option pushes them to concentrate more, as any mistake will take time to rectify as they have to inform the manager responsible and obtain approval to edit the information. However, the accountant perceived this as an advantage that strengthens ERP control. In addition, the financial analyst (Interviewee #11) confirmed that

> *"If you want to correct anything general in the books of accounts, you need approval from the manager. A notification will trigger the manager to approve or not approve. Once they have approved [it], the journal can be corrected." (Financial Analyst)*

In addition, he (Interviewee #11) added: "*You can mask the data ... there are certain security parameters applied, so they will [only] be able to see the data [that] is related to their responsibility.*" *(Financial Analyst).* These quotations explain the segregation of duty and authentication-level control policies that exist implicitly within ERP, with the financial analyst (Interviewee #11) expressing a sense of satisfaction in this regard. It prevents users from correcting their work themselves, which preserves continuous and real-time monitoring. Hence, it facilitates the work of the supervising body by reducing the time and effort spent on inspecting potential errors to keep the general ledger balanced and accurate. Similarly, the supply chain manager in the warehouse (Interviewee #10) appeared happy with these control policies, stating that

> *"The department can only make an internal requisition, whereas for us in the warehouse, we process it based on the quantity we have, and we can make the order from the CDC [central distribution center]." (Supply Chain Manager).*

Clinical managers in the medical facilities are permitted to plan for the resources or the consumable items they need for their units. In addition, the executive director (Interviewee #5) confirmed that they placed their orders based on a range identified in Oracle, which shows them the minimum and maximum number of items. However,

clinical managers are not authorized to confirm orders, as only the CDC warehouse has access to the data on the quantity. In addition, this control practice refers to the limited power of clinical managers; in the end, the patients are their priority. Similarly, those with a medical perspective agreed with the finance professionals, with the leader of nursing in home care (Interviewee #1) stating that

> *"[they see] all [the] data, once [they] enter [their] HC [Health Card] number, except some matters, like social issues, [which are] not shown for them; only the social specialist can see those details for patient privacy." (Leader of Nursing - Home Care)*

This quotation indicates that ERP enables nurses to review patients' histories and assess their conditions. However, the privacy of patient records is protected via an authentication level that only allows each user to access the data required for their specific function.

In terms of the system's accuracy, the supply chain manager (Interviewee #10) appeared unhappy and argued that "*they can cheat the system, in accounting terms. … I don't believe that Oracle is 100% safe and accurate.*" In contrast, the financial analyst (Interviewee #11) appeared satisfied and confirmed:

> *"There is always a history. … The biggest advantage in ERP is [that] you can always track everything … go back and see who made that mistake, what was done, and what was corrected, what time, what date, who approved it … we have business and system audits from different parties like internal audits, external audits, state audits." (Financial Analyst)*

It is evident that this conflicts with the supply chain manager's view. This quote indicates the audit trail that exists within ERP, which provides evidence on all actions, whether it is a transaction, a mistake, or a correction. In addition, the financial analyst (Interviewee #11) emphasized the system's accuracy as it is audited by different parties. This demonstrates the dual control policy, which ensures the validity and reliability of

the data. Furthermore, this increases users' awareness of the fact that their work is under supervision, which accordingly makes them more accountable.

In addition, the financial analyst (Interviewee #11) stated:

> *"You go to employee self-service … click on 'process,' and it will be directly delivered to your email. Now, there are still certain letters [that] are done directly by the system, but you have to go physically to collect them because of the confidential information that the letter contains." (Financial Analyst)*

This response shows that users' data privacy is protected, since the output of online transactions is limited. Hence, this demonstrates corporate accountability to employees.

In summary, although accessibility is beneficial, robust control policies and procedures are required to ensure data security and privacy. The findings from the interviews revealed that both the clinicians and accountants agreed that accessibility increases their responsibility to protect data and prevent its communication outside HMC. In addition, the findings revealed that the medical interviewees perceived some controls as a disadvantage. However, effective control procedures are implemented by ERP, including segregation of duty, limited remote access, and audit trails, all of which ensure the security and privacy of the data and make users accountable for both corporate and patient data.

5.3.5. Concluding remarks

In general, this chapter depicted the debate on ERP between two groups of professionals in HMC: clinicians and accountants. The findings from the interviews revealed that both groups are interested in and satisfied by ERP. They also revealed that the features of ERP support a number of MAPs, namely planning, decision making, control, and accountability. It appears that ERP is highly useful to users,

substantially facilitating and improving their work. However, in both groups, participants confirmed that ERP challenges them in some respects. In addition, the findings highlighted certain areas where there is disagreement between the two groups. While some aspects of ERP might satisfy one group, they are considered a disadvantage by the other. The next chapter will outline the different logics and focus on this contradiction based on the selected theory.

Chapter 6: Discussion

6.1. Overview

The previous section (Chapter 5) discussed the perceptions of ERP held by each group. Based on the institutional logic perspective, this chapter presents in-depth insights into each group's perspective depending on their logic (culture, values, and norms). The last part of this chapter interprets the relationship between the two groups and elaborates on how ERP logic enhances/challenges the collaboration between the two regarding MAPs.

Based on the institutional logic perspective discussed in Chapter 3, this case study drew on three main logics: clinical, accounting, and ERP. To address the research questions, this chapter is divided into three subsections. The first and second subsections present the results of the clinical and accounting logics, respectively, explaining how each responds to ERP logic/characteristics when practicing the MAPs of planning, decision-making processes, control, and accountability. The final section discusses the relationship between the clinical and accounting logics given the existence of ERP logic, highlighting the role of ERP logic in either sparking or mitigating contestations between the two groups in the context of MAPs. Figure 4 summarizes the relationships between the various attributes of ERP.

6.2. Clinical logic

This section discusses how ERP eases and/or hinders the daily routines of medical professionals. It also investigates how and why ERP aligns with or challenges the clinical logic.

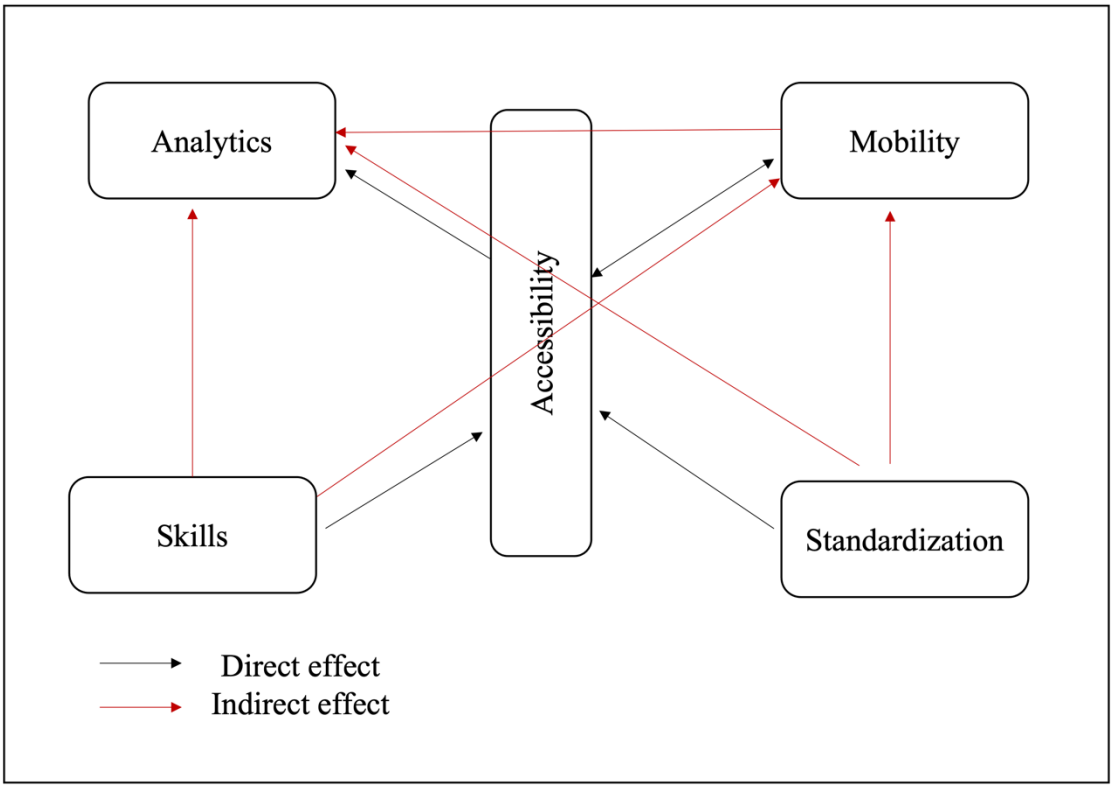

Figure 4. Relationships among the attributes of ERP

Figure 4 above presents the relationships between the various attributes of ERP, which were derived from the research findings and will be demonstrated in the discussion below. It shows that both skills and standardization have a direct effect on accessibility. Additionally, accessibility has a direct effect on analytics. Meanwhile, the relationship between mobility and accessibility is a reciprocal direct effect. Skills and standardization both have an indirect effect on mobility, while mobility, standardization, and skills all have an indirect effect on analytics via accessibility.

Regarding patient care, the findings reveal that ERP improves the quality of care services, as the availability of patient records reduces time and effort, which results in rapid and accurate planning and proactive decision making when necessary.

Hence, it accelerates services, affording more time to treat more patients. Furthermore, ERP provides clinical managers with control mechanisms to ensure plans and decisions are followed. It reduces the time and effort spent on creating reports to capture units' performances, and it enables managers to make proper, corrective, and timely decisions, as well as to intervene on time to protect patients from any deviations from these plans/decisions. Furthermore, it assists the supervision process, which increases subordinates' sense of accountability for self-regulation, leading to on-time services.

The above results contrast with the results of Carr and Beck's (2020) study, where managers complained about the late provision of data; however, they made no reference to the communication tool they used. However, the finding that accessible medical records via a centralized database enhances the quality of care services is consistent with the results of McNamara's (2000) study. Similarly, the findings support the aims of the National E-Health and Data Management Strategy, which states that the implementation of integrated information systems would improve patient safety as it consolidates healthcare capabilities and generates evidence-based decisions. Furthermore, the findings align with HMC's Nursing and Midwifery Strategy (2019), which intends to deliver appropriate treatment and intervene at the right time.

In addition, the results highlight that the availability of records via ERP ensures patient safety as it reduces medication errors—such as those that may occur in a pharmacy—by influencing dispensing decisions. This is in alignment with Rosenbloom et al. (2007), who found that availability reduces medical errors. In addition, ERP prevents and reduces the probability of medication errors through auto-supervision of medication delivery, benefiting from intelligence. Therefore, it helps

clinicians comply with the IHI's "five rights," reducing the burden on managers to control such issues. Accordingly, they are all able to fulfill their accountability to their patients. This is consistent with Bates et al. (2003), who revealed that integrated information systems are helpful in identifying and preventing medical errors. Additionally, according to the clinical managers interviewed, ERP protects patient privacy based on the authentication levels afforded to users. Moreover, the findings are consistent with the National Health Strategy (2018), which geared healthcare in Qatar toward improving care quality and enhancing patient safety. The strategy emphasized the adoption of technology to both provide preventive and proactive care and reduce errors by developing a robust monitoring system. Similarly, the results align with HMC's Nursing and Midwifery Strategy (2019), which urged the creation of a professional environment that provides safe healthcare and working to achieve zero errors.

The results also reveal that central databases contribute to research programs. This aligns with the goals of various health strategies in Qatar. To illustrate, the National E-Health and Data Management Strategy (2015) emphasized investing in integrated information systems in order to enhance clinical research and improve knowledge in this field. Additionally, the aim of the National Health Strategy (2018) was to make a greater effort to produce high-quality research that would assist the delivery of better and preventive healthcare. Moreover, HMC's Nursing and Midwifery Strategy (2019) aimed to provide professional, evidence-based clinical practices supported by effective research.

Regarding clinical managers' administrative role, ERP is helpful in the individual performance evaluation process as it reduces time and effort by increasing the availability of records and evidence. In addition, ERP improves accuracy based

on the segregation of duties and it provides dual control by seamlessly connecting several supervising parties (clinical managers and HR), which speeds up the decision-making process. In the same context, the availability of records to nurses is beneficial because it increases the consciousness of ownership. This motivates nurses to improve their performances, which is reflected in the quality of healthcare services. In addition, EPR improves the quality of services provided to staff, including nurses, by making them faster and more transparent, which reflects on the performance of staff in the medical facilities, preventing distractions in patient care.

Furthermore, ERP assists clinical managers in resource management, helping them to make effective allocation and selection decisions and maintain sufficient supplies while simultaneously considering both patient health and efficiency. It also involves them in the budgeting process and assists them in controlling plans to maintain efficiency while protecting these plans from any deviations. This also increases their subordinates' accountability. In addition, analytics has greatly improved HR management and planning. The associated processes have become as simple as clicking a button, at the unit, facility, and even hospital level.

Regarding mobility, the clinical managers interviewed were satisfied, given that it complements accessibility (as shown in Figure 4), significantly enhancing the quality of care services. It also appears to effectively accelerate the provision of healthcare services and allows for rapid intervention via remote access. In addition, mobility allows physicians to proactively determine appropriate plans in critical situations, protecting patients' lives. These findings are similar to those of Escobar-Rodríguez and Bartual-Sopena (2015), who mentioned that ERP makes data accessible from different sites, improving service quality and efficiency. Furthermore, mobility improves the health of staff, provides patients with more transparency, and protects patient records

in a safe location. Thus, ERP makes it easy for clinicians to practice accountability, and it also meets the corporation's relational accountability to its staff's health. Regarding transparency, the findings align with HMC's Nursing and Midwifery Strategy (2019), which planned to build a good partnership between each patient, their family, and the care provider. According to this strategy, this would be achieved by ensuring clear communication and encouraging shared decision making among the parties. Likewise, the aim of the National Health Strategy (2018) was to ensure transparency, enhanced communication, and accountability.

Regarding ERP skills, from the perspective of those in higher positions (clinical managers), they believed there are different capabilities within HMC. However, they were satisfied by computer-based documentation. It is auto-supervised to provide a complete patient record, reduce errors, and give a clear reading, which is often not the case with handwritten records. Thus, computer-based documentation through ERP provides individual control, affecting record availability (as shown in Figure 4), which accordingly affects healthcare services. In other words, the skills required to deal with ERP affect instrumental accountability and lead to the fulfillment of relational accountability. From this perspective, users who have the required skills to deal with ERP technology can provide accurate and real-time information, consequently affecting healthcare services. In addition, ERP appears to increase user accountability to the corporation to learn and improve such skills, as it affects their performance evaluation scores.

Furthermore, the clinical managers expressed satisfaction with the structured documentation through ERP, which provides individual control over patient records. These findings are consistent with those of Rosenbloom et al. (2007), who also concluded that ERP increases the quality of patient records by enhancing compliance

with documentation requirements and reducing both errors and the possibility of under-documented records. As a result, it affects the accessibility of patient records, in turn affecting the quality of patient care. This aligns with Adler-Milstein and Bates (2010), who reported that EHRs increase the reliability of information, which assists clinicians in making a precise diagnosis.

Medical processes and decisions are performed based on horizontal dependency across departments (Nyland et al., 2017). The above findings show that ERP logic is compatible with the nature and dynamism of HCOs and that it contributes considerably to patient care by making real-time patient data available on one database that is accessible across lateral departments. According to Evetts (2010), clinical managers have a dual role that includes the duties of two types of profession: occupational and organizational. The above findings indicate that ERP logic is consistent with clinical logic, particularly with regard to clinicians' occupational profession, which is related to collegial authority and professional ethics and is subjected to monitoring by institutions and associations (Evetts, 2010). In this study, the clinicians expressed positive opinions toward ERP when it was consistent and congruent with their occupational professionalism, ethics, and values, according to which the priority is the patient. This case contrasts with that described by Carr and Beck (2020), who found that clinicians complained about outdated information and reports, especially in the emergency department. Thus, these findings reflect the importance of ERP in the healthcare sector.

Furthermore, the research findings reveal that ERP motivates managers to practice their organizational profession. Evetts (2010) defined an organizational profession as a managerial profession depending on rational legal authority to practice standardized processes to both demonstrate accountability and achieve a set target

while being subjected to performance evaluation. This case study highlights the fact that the attributes of ERP provide managers with the essential information required for management processes—such as budgeting—bringing transparency to these processes. In addition, it illustrates that clinical managers are engaged in preparing such information. This is consistent with Carr and Beck (2020), whose results highlighted that clinical managers have an effective role in the management process when they have the relevant information and when their suggestions are considered.

Furthermore, the results show that clinical managers accepted ERP as a facilitator in their units because they were convinced that ERP logic would not take precedence over their logic in most cases, allowing them to prioritize patients. This is in line with Numerato et al.'s (2012) proposition that clinicians might respond to managerial tools based on a hybrid identity. This research reveals that the compliance of ERP logic with clinical logic smoothly engages clinical managers with management mechanisms. Thus, it complements Carr and Beck's (2020) study, which emphasized that engaging clinicians in the management process would be successful when management's objectives are aligned with clinicians' objectives. In other words, clinicians are able to undertake an organizational role along with their core/occupational profession when organizational objectives are consistent with their core logic.

Furthermore, the findings of this study are similar to those of Evetts (2010), who confirmed that while clinicians are occupational professionals, they are flexible enough to undertake organizational responsibilities. Moreover, clinical managers' engagement in management processes is dependent on the availability of necessary information (Pizzini, 2006). Accordingly, this research adds to the study conducted by Carr and Beck (2020), who found that the work of clinicians is in opposition to

managerial demands, explaining that in such a case, relevant information was likely to be unavailable. However, such a dilemma can be solved through ERP in a complementary manner based on involving clinicians and considering their views.

Furthermore, stemming from the theoretical insights discussed in Chapter 3, it can be concluded that HMC is a pluralistic organization with an institutionally complex environment. According to the institutional logic perspective, multiple pressures affect the interactions between different professionals and environments (Thornton et al., 2012), leading to different institutional orders/accountabilities. This case study demonstrates several types of accountabilities based on diverse demands. These include employees' accountability to patients, HMC's accountability to its employees, employees' accountability to HMC, HMC's accountability to governmental agencies, and HMC's accountability to the community.

Accountability is a vital practice that ensures employees demonstrate the desired behavior when working toward the intended outcomes. Frink and Klimoski (2004) reported that organizations require several sources and mechanisms to develop accountability, both formal (e.g., performance evaluation and supervision) and informal (e.g., feedback). This research shows that ERP controls embed formal sources of accountability. With regard to patient care, ERP attributes allow clinicians to practice instrumental accountability based on compliance logic, fulfilling social accountability based on public service logic. Concerning the services provided to employees/clinicians, ERP enhances these, helping HMC meet the demands of its accountability to clinicians and helping clinicians practice their accountability toward patients. Hence, following Stewart's (1984) ladder, these findings are similar to the point raised by Rana and Hoque (2020), who proposed that accountability begins with compliance logic and managerial accountability, consequently meeting relational

accountability.

Furthermore, this case study shows that ERP helps clinical managers in terms of the control needed to govern their units. In addition, it stimulates financial accountability based on performance evaluation and monitoring (formal accountability sources), motivating managers to support their units and handle them efficiently. Accordingly, it allows managers to practice instrumental/managerial accountability based on compliance logic. This finding is in line with Macinati et al.'s (2021) conclusion that the availability of sources of accountability strengthens clinical managers' sense of financial accountability and reflects positively on their commitment, which consequently affects their performance.

However, the clinical managers interviewed also complained about availability. In particular, the existence of all medication options in a single location burdens them with increased responsibility regarding monitoring and protecting patient safety. In addition, they argued that ERP reports do not represent a final decision and that clinical wisdom is required in areas, reflecting their core logic. Generally, clinicians do not accept having another power judge a case in which they are involved since they are the ones with the knowledge and experience in their field. Thus, this finding aligns with the case outlined by Reay and Hinings (2009), which showed that clinicians believe that they are the key professionals in HCOs and are the most capable of making appropriate decisions that others should follow.

Furthermore, the clinicians interviewed in this study considered ERP to lack certain management mechanisms, such as individual performance evaluations, which are still conducted manually. In addition, they believed that the addition of these features would speed up the decision-making process. They also mentioned that capital assets planning and management are not yet integrated. However, this also

reflects their sense of ownership, as the interview findings highlight clinical managers' involvement at the earliest stages, which motivates them to think further about ERP improvements and attributes.

In addition, there were other issues regarding remote access, including patient complaints. For some clinical managers, limited access outside the facilities is a shortcoming in ERP that hinders the decision-making process. However, the purpose of this limited access may be to control the power given to clinical managers, providing them with a level of authentication based on the requirements of their unit.

Concerning the skills required to deal with ERP, individuals have different abilities to deal with technology, and some at HMC did not have any experience with computer-based documentation. This appeared to be a struggle for frontline clinicians, hindering them in discharging their accountability to patients, with some complaining that they spend more time on documentation than on treatment. In addition, some of the nurses initially demonstrated resistance, attempting to solve this problem by delaying the documentation until they reached the office, which was forbidden later on.

The above result aligns with Mucheleka and Halonen (2015), who argued that successful implementation in the healthcare sector takes time, as it is likely that issues regarding user resistance will be encountered until they become familiar with such organizational change. Therefore, the logic of some clinicians (frontline workers) appeared to clash with ERP logic—which aims to provide real-time data, especially on patients—thus affecting their accountability. In addition, delaying adequate documents and records on a real-time basis negatively affects the internal control system. Therefore, the requirement for these skills challenges users when it comes to practicing their instrumental and social accountability. In other words, the clinicians

showed resistance to ERP when they realized that documentation decouples them from their core/occupational profession, consequently impeding their organizational profession. These findings are similar to points highlighted by Rosenbloom et al. (2007), who found that some clinicians consider writing notes to be more time-efficient than computer-based documentation, which is inefficient for patients as it decouples clinicians from patients.

However, real observations from homecare services indicate that skill levels will not impact services negatively when the team is formed effectively. The team's composition should be cross-functional and include all the abilities required for homecare visits. Thus, fulfilling accountability depends on the quality of the team, which should include a leader skilled in management and a competent member skilled in ERP to avoid any inconveniences or delays. The team leader should allocate tasks to the team members professionally, assigning members capable in ERP to documentation-related tasks to accelerate care services.

The interview findings also indicate that clinical logic conflicts with ERP logic in terms of standardization, as it promotes standardizing the structure of patient records. The clinical managers believed that the medical field requires continuous research and improvements, meaning that clinical documentation cannot be standardized. This aligns with Khoumbati et al. (2006), who confirmed that information systems in HCOs are self-ruling and diversified. The findings from the interviews highlight the changeability of such environments, which pushes management toward customizations and amendments in ERP from time to time, as treatment plans often require changes. In addition, the research findings reveal that top management at HMC provides effective support. However, it is a large organization, which means that it takes a long time for enterprise-level

changes/customizations to be reflected throughout all its facilities.

In addition, the clinicians interviewed complained that standardization impedes narrative documentation, which cannot be structured in a particular way because clinical procedures vary from one patient to another depending on the situation, as well as from one physician to another (Jenkins & Christenson, 2001). This finding is similar to that made by Rosenbloom et al. (2007), who revealed that computer-based forms are structured in such a way that does not satisfy clinicians, especially when they experience unexpected patient situations.

In addition, the findings are consistent with Busco et al.'s (2008) argument that standardization is a source of tension when it coexists with differentiation in practices. From this viewpoint, it conflicts with the identity of the medical environment of HMC, which is one of uncertainty and changes (Kurunmaki et al., 2003; Lapsley, 2001; Nyland et al., 2017). The clinical managers considered this issue to be a significant challenge since there is no chance to work around, as was possible with the previous manual method. Therefore, in some cases, they are forced to keep paper-based documentation explaining the whole truth about a patient's situation. This is consistent with Rosenbloom et al.'s (2007) conclusion that computer-based documentation compels clinicians to use more than one method of documentation since structured templates reduce expressivity. Therefore, ERP obstructs healthcare providers from communicating the entire truth, negatively affecting record availability, which could in turn affect the quality of care services.

Thus, the above findings show that—in terms of standardization and skills—ERP logic is not guaranteed to be compatible with clinical logic, which depends on patients' situations and users' skills. In other words, it might hinder clinicians from practicing their instrumental accountability to both comply with HMC's rules and

provide real-time data, which could impede them in fulfilling their social accountability.

Furthermore, the interview results show that ERP inflates the accountability of clinical managers to build a strong control environment and protect patient privacy from insider threats. These managers have to increase awareness of this issue among their subordinates and foster integrity. In this task, they are supported by the IT team, which sends frequent emails. This conflicts with Elmuti and Topaloglu (2013), who reported that when security is an issue, whether the organization uses ERP or another system, it should always be tested. Instead, the findings show that protecting ERP from undesired access/communication can protect clinical logic, which is geared toward protecting patients' privacy.

In addition, the managers complained that the ERP system gives them no option to modify or delete information, something which they perceived as a drawback that has to be fixed as it is time-consuming and costly for the corporation. However, in reality, this is an effective control mechanism that ensures transactions are monitored on a real-time basis. Therefore, in this context, clinical and ERP logics complement each other through the control and accountability embedded in ERP.

To summarize, ERP logic has different effects on clinical logic. On one hand, it appears harmonious with clinical logic in terms of accessibility, analytics, mobility, security, and privacy, enabling those in both clinical roles to practice their instrumental, managerial, and social accountability. On the other hand, ERP appears to be incompatible and conflicts severely with clinical logic in terms of skills and standardization, obstructing both instrumental and social accountability.

6.3. Accounting logic

This section discusses how ERP eases and/or hinders accountants' duties and

presents reasons as to how and why ERP aligns with or challenges the logic of the finance profession in the healthcare sector. Particularly, the discussion will show how ERP logic affects both the bean counter and business partner roles, as well as the types of accountabilities, outlined in Chapter 3.

Accounting logic is dominant within any organization. However, it differs in HCOs, where clinicians influence accountants and patients are the priority. The research findings show that ERP enhances intra-organizational relationships. The perspectives of those in finance revealed satisfaction with ERP with regard to applying managerial tools. It creates an easy method for budgeting and resource management by integrating the medical and finance sides. Moreover, it allows for effortless control of these plans through communication.

ERP produces tailor-made reports (Carlsson-Wall et al., 2021)—such as those on cost and variance analysis—facilitating decision making, planning, control, and accountability to ensure corporate efficiency. Additionally, these reports ensure a sufficient supply level for the medical facilities, meeting accountability toward patients. ERP was particularly helpful for the supply chain management department during the COVID-19 pandemic due to the facility-level transparency it provided, which allowed for the reallocation of resources as required. In the same context, those in finance confirmed the usefulness of the mobility provided by ERP in maintaining a good level of care, given that HMC is a changeable environment that requires prompt decision making. It also contributed to population health, particularly during COVID-19 when employees had to work from home.

However, those on the finance side disagreed with the clinical professionals with regard to how ERP captures individual performance. While for the clinical managers, assessing clinician performance is based on how well a clinician has

performed, those with a finance viewpoint explained that performance is based on how many procedures a physician has performed. This reveals a conflict between the two distinct logics. Moreover, the findings reveal that ERP logic is associated with NPM principles, according to which the literature suggested that management accountants in the public sector should attempt to undertake an advisory role (Holmgren et al., 2018; Mack & Goretzki, 2017).

Furthermore, the findings are in alignment with the National Health Strategy (2018), which stated that the MOPH would focus on specific indicators when measuring performance and on achieving efficiency when delivering healthcare services. This was previously stated in the National E-Health and Data Management Strategy (2015), which emphasized that coded data would generate KPIs and enable analytics, enriching the health regulators' knowledge of treatment plans and their outcomes. Both strategies suggest that treatment plans will be oriented toward providing better care, achieving better health outcomes, and increasing efficiency. Accounting is based on the premise of evaluating outputs based on inputs used or received (Pettersen & Solstad, 2014), Thus, ERP appears to fit with accounting logic.

Additionally, the finance professionals agreed with the clinical managers' opinion that ERP improves internal communication and accelerates staff services, increasing transparency. It also enhances the monitoring of transactions, enabling the responsible users to be properly accountable to clients (employees). Furthermore, it provides adequate documents and records, strengthening the control system and supporting the verification process when dealing with both insiders and outsiders. Thus, it allows accountants to fulfill their accountability since it increases accuracy.

Based on the above discussion, it is evident that ERP logic enhances management accountants' business partner role by making data available and

facilitating the production and processing of reports. This finding is in line with both Scapens and Jazayeri (2003) and Spraakman et al. (2018), who came to a similar conclusion that ERP eliminates routine activities, providing an opportunity for analysis and contributing to an organization. However, it contradicts the findings of Carlsson-Wall et al. (2021), who documented that the ERP implemented in their case study was incompatible with the needs of management accountants to add value at the divisional level; in contrast, it increased the manual work involved in the business partner role.

In addition, from the finance professionals' perspective, standardization regulates the connection and provision of data on a real-time basis, strengthening control practices, such as implicit supervision. Thus, it systemizes the accomplishment of tasks, increasing the commitment of subordinates to maintaining the timely availability of data.

In terms of security and privacy, the results reveal satisfaction with control policies, such as the segregation of duty, the establishment of authentication levels to ensure continuous monitoring processes, and the highlighting of errors on a continuous basis to ensure efficiency. Furthermore, the audit trails help identify error sources, and the dual control ensures accuracy. Thus, in terms of control, ERP fits well with accounting logic, allowing users to fulfill their instrumental/managerial accountability. The finance professionals trusted that the limited availability of online documents is necessary to protect client privacy, which reflects the corporation's accountability to its employees. This conflicts with the opinion of some of the clinical members that limited access is not a shortcoming but a necessary measure for security purposes.

Furthermore, ERP strengthens extra-organizational relationships as it allows

HMC to communicate with third parties—such as suppliers—leading to effective and efficient decision-making processes. Additionally, it helps with HMC's accountability to other governmental entities as it facilitates and automates the reporting process and notifies users of any shortages. Consequently, it empowers the related governmental entities to monitor HMC, assisting the organization in its accountability to society. Overall, these findings are similar to the conclusion made by Carlsson-Wall et al. (2021) that ERP provides management accountants with prefabricated information, assisting their bean counter role in terms of fulfilling extra-organizational requirements. The findings comply with Qatar Second National Development Strategy (2018), which emphasizes the need to improve communication, cooperation, and coordination between all development associates. Additionally, real-time reporting helps accomplish the goals of the National Health Strategy (2018) with regard to building a robust monitoring system, achieving efficiency and the effective use of resources, and improving the quality and safety of healthcare.

In line with the perspectives of Rana and Hoque (2020) and Vosselman (2016), ERP logic enables accountants to practice instrumental accountability based on the compliance logic of following rules to meet patient care requirements and employee needs. In addition, it allows those in finance to practice their instrumental accountability to governmental entities, creating a sense of relational accountability to protect population health and save the country's resources.

The research findings demonstrate that ERP appears to balance and support both accountant roles of bean counter and business partner. It allows accountants to contribute to organizational facilities, assisting them in fulfilling their local responsibility as business partners. Moreover, it enables them to comply with extra-organizational requirements, assisting them in meeting their functional responsibility

as bean counters. This contradicts Carlsson-Wall et al. (2021), who found that ERP does not help management accountants' business partner role and that it reduces their contributions as analysts and advisors within their organization's units, while it does encourage their functional role. In addition, consistent with Rana and Hoque (2020), this case study reflects the principle of NPM that aims to combine two accountability logics: financial/instrumental and non-financial/social. Moreover, it shows that the primary logic of accountability is based on compliance with an organization's rules and regulations—which is also in line with Rana and Hoque (2020)—leading to other types of accountability.

However, those in finance criticized ERP for creating non-routine work and increasing their responsibility to produce data for other users as the finance department has become accountable for any shortage or deviation. In addition, the transition stage was difficult and sensitive, and they felt as though they were building a foundation for ERP, burdening them with ensuring data accuracy and avoiding errors. However, currently, they are satisfied as they were able to build a central database that nourishes the internal control system's policies with adequate records and documents.

In addition, in the case of supply chain management, they complained about an absence of transparency at the unit level, which they see as a drawback to integration. Furthermore, some of the finance professionals agreed with the clinical opinion that ERP is time-consuming, which refers once again to user experience. In this respect, if a user lacks the relevant skills, it may impede their ability to accomplish a task quickly and accurately. This may cause them to struggle in practicing their instrumental accountability, negatively impacting other aspects of ERP. In addition, those in finance agreed with those on the clinical side that standardization does not satisfy the

specificity of each type of business and that it might therefore hinder them in meeting their reporting responsibilities. However, those on the finance side felt this could be avoided if customization was developed in the earliest stages of implementation, which conflicts with the view of those on the clinical side, who believed that ERP in this field requires continuous customization.

Furthermore, the finance professionals agreed with the clinical professionals that accessibility increases their accountability to protect data from undesired access, although those in finance were more concerned with outsiders than insiders in this respect. Thus, the financial perspective can be interpreted similarly to the clinical perspective. The protection of ERP logic, which aims to authorize access, could protect the accounting logic, which depends on the sensitivity and confidentiality of data. In addition, there were conflicting opinions regarding accuracy. For example, those in supply chain management did not believe in the accuracy of ERP and they did not preclude the possibility of manipulation. In addition, those in finance believed that ERP modification was a time-consuming process that forced them to concentrate more. However, unlike the clinicians, they saw this as an advantage.

In summary, ERP logic most likely impacts the finance side positively; it appears to be compatible with accounting logic, meaning they complement each other. Eventually, ERP strengthens control policies and procedures to meet financial accountability, enhancing both intra- and extra-organizational relationships.

6.4. Relationship between clinical and accounting professionals

This section discusses how ERP eases and/or adds tension to the relationship between the medical and finance professionals. It will explain how ERP logic as an institutional change impacts the collaboration between these two distinct groups.

ERP appears to strengthen cooperation between both groups by involving

clinical managers in the implementation of managerial tools. To illustrate, ERP enriches the budgeting system Hyperion (see Chapter 4) with the required data from all facilities, smoothing the path to determine and plan the appropriate budget. This aligns with Jacking and Spraakman (2006), who reported that ERP improves information provision for budgeting. Additionally, it complies with the National E-Health and Data Management Strategy (2015), which asserted that better quality, coded, and standardized data will facilitate analytics, which will highlight areas that need national funding as a priority. Additionally, the strategy confirms that standardized data will help evaluate the effectiveness of such plans.

In addition, the results show that ERP involves clinical managers in determining the budget, which enhances their financial role and increases their sense of ownership and loyalty toward these plans. In other words, clinical managers' involvement in management tools—such as budget planning and control—assists them in cooperating with those on the finance side and avoiding any deviations from the plan. This is similar to the results of Reay and Hinings' (2009) study, which demonstrated that engaging physicians and considering their input in the decision-making process enables management bodies to comply with the physicians' objectives, the aim of which is also to achieve efficiency.

Additionally, integration works as a control tool, protecting the plans from deviation. A clinical unit cannot exceed its specified budget as the integration notifies the clinical managers of the outstanding balance. Thus, the above factors should mitigate conflict as the clinical managers are encouraged to protect the budget from deviation. Furthermore, by pointing precisely to accountability practices, ERP provides a connection between the two groups, allowing them to meet their instrumental accountability to subordinates (such as staff nurses), positively

influencing social accountability (patient care).

Those on the finance side also confirmed that ERP enables HMC to manage breakdowns in communication effectively, as all facilities and users are connected through ERP. Additionally, the findings reveal that ERP removes time and location barriers, connecting managers with medical facilities when an urgent decision is required. Thus, it allows the two distinct groups to contribute effectively to patient care. ERP was highly effective during the COVID-19 pandemic. Even from a finance perspective, it had a hugely positive impact on healthcare services. Thus, this result demonstrates how the accounting logic in HCOs is influenced by clinical logic, considering ERP as a tool to fulfill relational accountability based on public services logic. This contrasts with the conclusion of Reay and Hinings (2009), as they did not recognize this collective logic in their study and found that the physician and management groups were highly distinct. This present case study recognizes that the two groups are influenced by each other in many situations. This is consistent with Lounsbury (2008), who suggested that collective efforts may give rise to a new logic.

Furthermore, ERP appears to create a balance of power between the clinical and finance sides. For instance, it allows clinical managers to address the consumption and supply needs in medical units and highlight the items and quantities required based on their own logic. Thus, it enables them to practice resource management for their units, which supports accounting logic regarding controlling expenditure and achieving corporate efficiency. Despite the freedom that ERP grants clinical managers to govern their units/facilities, those in finance can still monitor and track overall performance, which satisfies their logic. Accordingly, it allows both groups to fulfill their accountability and achieve efficiency. ERP logic appears to play the role of a mediator, producing a balance between the clinical managers and accountants.

The above research findings thus contradict the case reported by Oppi and Vagnoni (2020), in which the accounting information was not associated with clinical managers' needs, meaning it did not support the decision-making processes in their units. This was due to the fact that accounting information systems support functional responsibility and are designed to comply more with regional authorities' requirements than the needs of clinical units. Similarly, the research conflicts with Carlsson-Wall et al. (2021), who concluded that ERP is built to support the functional requirements of municipalities and that it hinders management accountants in contributing to an organization's units. In contrast, this case study reveals that ERP in HMC fosters both centralization (enhancing management accountants' bean counter role) and decentralization (enhancing their business partner role). Consequently, it allows clinical managers to achieve efficiency at the unit level. This research finding extends Oppi and Vagnoni's (2020) view, illustrating how ERP is able to mitigate ambiguity in management accountants' role and produce a balance between functional and local responsibilities.

Regarding security issues, those on the finance side were happy with the control policies and procedures, such as the segregation of duty and varying authentication levels. Although power is decentralized and given to clinical managers—strengthening their administrative role—this power is still limited, given that the priority on the medical side is the patients. On the finance side, they were satisfied with this, as it can help to mitigate conflict between the two groups. However, in some of the interview responses, the clinical managers revealed they had a hybrid identity, making references to costing, budgeting, and controlling financial issues. Hence, this also plays a role in mitigating any rivalry between the two groups.

As a technology, ERP has both positive and negative impacts on clinicians'

relationships with those on the finance side. The research findings show dissatisfaction with ERP as a channel to connect the groups in some areas. From a finance perspective, a participant complained that ERP is not yet fully integrated as it does not show them the performances of clinical units in terms of supply consumption. This appears to be a decentralization technique to provide clinical managers with more power as, in accordance with their logic, patients are their priority. Clinical leaders are better aware of patients' needs than those in finance; thus, this decentralization helps them to provide effective and efficient healthcare services. This decentralization strategy and the managerial power it affords clinical managers may mitigate tension when applying management mechanisms. In other words, complete integration between the finance and medical sides, without freedom for clinical managers, may lead to undesired interventions from the finance side, which could spark conflict between the two parties and harm the quality of healthcare services.

In addition, some of the interviewees on the finance side perceived that the skills required to use ERP hindered them in responding to the needs of the medical facilities immediately. According to this opinion, ERP negatively affects their relationship with the medical side of the organization and their accountability for patient care as a lack of the relevant skills on the clinical side might slow down certain processes. This finding refers back to the importance of user experience and skills, particularly in such a complex environment.

In addition, ERP challenges users/accountants who are in the position of making unusual decisions or are engaged in problem solving. It increases the burden of making the right decisions that allow other users to carry out routine tasks to fulfill their duties. The financial administrators—as well as those ensuring accessibility—are the innovators, especially at critical times, while other users are data recipients.

Thus, according to this relationship, the role of the accountants affects the primary users in HCOs—the clinical managers—since they need information produced by accountants for decision-making purposes within their units (Oppi & Vagnoni, 2020). HCOs are changeable and uncertain environments (Kurunmaki et al., 2003; Lapsley, 2001; Nyland et al., 2017), meaning that ERP is exposed to continuous research and improvements, something which was confirmed by the clinical managers. Continuous changes in treatments and procedures demand accounting information that reflects these changes financially. Thus, accounting information must be communicated to the managers for decision-making purposes within their units (Conrad & Uslu, 2011; Oppi & Vagnoni, 2020; Szczesny & Ernst, 2016).

The above findings illustrate how unexpected incidents can challenge accountants, reflecting the tension between the medical and accounting departments. This finding is also consistent with Oppi and Vagnoni (2020), who documented that the healthcare environment challenges and places stress on management accountants to provide accurate and reliable accounting information. Therefore, in terms of accessibility, ERP logic appears to satisfy clinical more than accounting logic. Once ERP is implemented, primary users (clinical managers) receive prefabricated data as a final consumer more promptly than before. However, this places more stress on the finance side in unexpected situations, and the logic of ERP burdens accountants as business partner actors in such cases.

To conclude, the positive aspects of ERP outweigh the disadvantages, and in most respects, both the clinicians and finance professionals seemed satisfied by the way ERP has connected the two groups. ERP appears to mitigate tension for clinicians in terms of applying managerial mechanisms that respect the priority of patient health. Concerning the decision-making process and planning MAPs, it encourages the

involvement of clinical managers in managerial mechanisms, such as budgeting, costing, and resource management. Regarding accountability and control MAPs, ERP also involves clinicians and finance professionals in performance evaluations and expenditure control. This is consistent with Sánchez-Rodríguez and Spraakman (2012), who concluded that ERP enhances transparency, helping to achieve efficiency. Thus, it bridges the divergent logics of clinicians and accountants and allows both to meet their instrumental and relational accountability.

In addition, ERP respects both groups, creating freedom for each to exert their logic. In this way, it mitigates tension between these two conflicting logics. ERP enables those in finance to meet the needs of the medical facilities promptly. Thus, accounting logic complements clinical logic when ERP logic exists. In other words, ERP enables the two logics to complement each other and co-exist without one having dominance over the other. These findings are consistent with a previous study conducted by Reay and Hinings (2009), who emphasized that conflicting logics can co-exist and work together when there are mechanisms in place that manage the competition between the two logics, enabling both logics to fulfill their interrelated tasks.

Furthermore, ERP respects the independence of each logic. This aligns with Huxham and Hibbert (2008), who concluded that collaboration should consider the independence of the clashing groups, respecting their norms and values and helping them succeed in their goals. Additionally, the financial findings from both the clinicians' and finance professionals' interviews reveal that there is more focus on budgeting practices and controlling compliance with budgets. This finding is similar to that made by Rana and Hoque (2020), who documented that managerial accountability based on compliance logic in the public sector is mainly focused on

budgeting accompanied by financial control.

6.5. Concluding remarks

To summarize, this chapter organized the research findings and analyzed them based on an institutional logic perspective to provide in-depth insights and understanding for readers. According to the institutional logic theory framework discussed in Chapter 3, the findings of this case study drew on three main logics: clinical, accounting, and ERP. To answer the research questions, this chapter was divided into three subsections. The first and second subsections presented the results of the clinical and accounting logics, respectively, explaining how each of these logics respond to ERP logic/characteristics in four MAPs: planning, decision-making processes, control, and accountability. In addition, the discussion demonstrated how different MAPs are dependent on and complement each other. The final section discussed the relationship between clinical and accounting logic given the existence of ERP logic, highlighting the role of ERP in either sparking or mitigating conflict between the two logics in the context of MAPs. The next chapter will highlight the main findings of the study, followed by its contributions and implications. Finally, the limitations of the study and suggestions for future research will be discussed.

Chapter 7: Conclusion

7.1. Key insights

This thesis investigated the impacts of ERP on MAPs on two professions in the public healthcare sector in Qatar. Specifically, it intended to explore the effect of such technology on the most distinctive, competitive, and significant healthcare professions: clinicians and accountants. Additionally, it investigated the impact of ERP on their relationship, especially concerning MAPs. This thesis adopted a qualitative research method and single case study approach, conducting semi-structured interviews with members of HMC to address the research questions. The case study drew on the institutional logic perspective to obtain a deeper and more extensive understanding. Thus, the research findings were allocated into two main sections (clinical logic and accounting logic) in the discussion chapter (Chapter 6) to understand how each group perceives ERP. Then, the relationship between the two groups was explained, considering the role of ERP. Thus, the investigation and discussion led the researcher to address the research questions as follows.

The first objective of this thesis was to elaborate on how each group perceives ERP based on their logic. Accordingly, the first research question was:

RQ1: What is the impact of ERP in the healthcare sector on medicine and finance and how is it perceived by medical and finance professionals?

RQ1 was answered in the first and second sections of Chapter 6, which detailed how each group perceives each attribute of ERP and considered the functions abstracted during the thematic analysis stage: (1) planning and decision-making processes and (2) accountability and control. The results highlighted both the alignments and misalignments between each profession and the attributes of ERP.

Overall, the results revealed that clinical managers perceive ERP as a tool that

assists them in both their clinical and administrative roles. In addition, they wish to integrate more of their practices with ERP—such as individual-level performance evaluations and planning for capital assets—making these interactive with the technology. Accordingly, clinical managers appear to accept ERP logic, and it seems to complement their own logic in most respects. When discussing accountability and control MAPs in particular, the results were split into two opinions. With regard to clinicians' role in patient care, ERP logic complies with clinical logic by providing accessibility, analytics, mobility, security, and privacy. Thus, ERP enhances both instrumental and social accountability.

In contrast, ERP logic contradicts clinical logic in terms of standardization and skills, with these two properties hindering clinicians in practicing their accountability to patients. However, only standardization conflicts significantly with clinical logic since the issue on the skills side can be managed. With regard to clinical managers' administrative role, ERP logic conforms with clinical logic, helping them fulfill their accountability. Moreover, mobility appears to be more beneficial for them in terms of patient care. Generally, regarding accountability and control, the clinical managers expressed satisfaction in most aspects.

On the finance side, accountants expressed satisfaction with ERP in terms of executing management mechanisms, such as budgeting, costing, and individual- and unit-level performance evaluations. However, the finance professionals found that the accessibility provided by ERP burdened them with the responsibility of producing data for other users. Furthermore, ERP does not appear to conflict with accounting logic. In addition, some of the finance professionals did not believe ERP was fully integrated, and they desired more transparency and control, which reflects their core logic in evaluating outputs to inputs.

Additionally, the results revealed disparities between the perceptions of ERP held by the medical and finance professionals, reflecting their norms and values. In particular, clinical managers did not consider ERP to be active in performance evaluation at the individual level as they tend to evaluate how well clinicians perform. In contrast, accountants were satisfied in this respect, as ERP allowed them to see how many tasks were performed. In addition, clinical managers perceived the limited options in remote access as a shortcoming, while accountants perceived it as a control mechanism. The clinical managers also found the duplication and absence of change/ modify options to be a disadvantage, while this was seen as an advantage by the accountants. Furthermore, the findings highlighted similarities between the groups. For example, both the clinicians and accountants complained that ERP burdens their monitoring responsibilities with regard to security.

The second objective of this thesis was to examine the impact of ERP on the relationship between the medical and finance sides of an organization. Thus, the second research question was:

RQ2: How does ERP affect the collaboration between those in the medical and finance professions?

RQ2 refers to the most competitive relationship in the healthcare environment. The researcher thus wanted to understand how ERP impacts this relationship, considering the implementation of MAPs. Additionally, the aim was to explore the effect of such diversity within ERP logic. The final section of Chapter 6 provided such insights, and it was concluded that ERP mitigates tension between the two conflicting logics. In particular, the results demonstrated that ERP involves both groups in managerial tasks while maintaining each logic's independence. Therefore, this research revealed a combination of logic on the clinical managers' side, since they referred to

managerial mechanisms without complaint and appeared to agree with the aims of achieving efficiency, reducing waste, and protecting resources. Thus, ERP appeared to bridge the two sides, enabling them to fulfill their accountability toward each other and helping them accomplish their interrelated goals. Within ERP, co-existing logics complement each other without one dominating the other. In general, nothing is perfect, yet the advantages of ERP in HMC (and the medical field more broadly) appear to far outweigh the drawbacks.

In short, the research findings demonstrated both similarities and differences between the two groups, which may refer to where ERP sparks or mitigates tension between them. Similarities were evident in terms of enhancing intra-organizational relationships and monitoring. Additionally, both groups agreed on protecting ERP security to protect their logic. While both sides believed in the benefit of standardization, they disagreed on the role of ERP in individual performance evaluations, limited remote access, modification options, threats, standardization, and customization.

With regard to the research context, the findings appeared to align with national strategies in Qatar, such as the National E-Health and Data Management Strategy, the National Health Strategy, and various national development strategies. Additionally, it is in line with HMC's vision and strategies, such as the goals of the Nursing and Midwifery Strategy. Therefore, the outcomes of investment in technologies in healthcare appeared to achieve the above strategies' targets, all of which are working toward achieving the goals of Qatar National Vision 2030.

7.2 Research contributions and theoretical and practical implications

This thesis contributed to the literature by filling a gap in the knowledge and highlighting extended and conflicting findings. It contributed to qualitative research by

providing empirical evidence from HMC, a prominent and leading healthcare organization in the Middle East and the main healthcare provider in the State of Qatar.

This case study also provided practical insights for managers and policymakers in the public healthcare sector in Qatar, as well as for healthcare information system providers. In particular, it presented empirical evidence on how medical professionals respond to and perceive ERP technology. This might be of interest to policymakers and developers, who could use it to improve the IT solutions implemented in HMC to fit with users' specific needs. In addition, the findings may be of interest to other hospitals in the private sector. The results highlight the benefits and drawbacks of ERP technology, allowing for optimal implementation.

This thesis also responded to suggestions for future research made by previous studies. Rana and Hoque (2020) suggested exploring accounting, accountability, and NPM mechanisms in nations other than Australia and contributing to the institutional logic perspective from the perspective of other governmental systems. Accordingly, this research extended their study by presenting findings from one of the most significant emerging economic countries in the Middle East (Qatar). This study also extended the work of Rana and Hoque (2020) by providing insights from healthcare as a specific and complex sector. In addition, it considered accounting practices and financial accountability from the perspective of clinicians as non-finance professionals. Furthermore, this study employed ERP technology in examining management accounting and NPM practices—including accountability—which was not the case in the study conducted by Rana and Hoque (2020).

In addition, Reay and Hinings (2009) suggested examining mechanisms that could manage tension between competing institutional logics and recommended that future researchers extend their findings in other contexts. Thus, this case study

expanded on this work by concluding that ERP technology is a functional mechanism that mitigates rivalries between multiple logics. In addition, it extended the work of Macinati et al. (2021) by highlighting ERP technology as a source of financial accountability for clinical managers. This was supported by a both subjective and inductive view, which was not the case in the study conducted by Macinati et al. (2021).

In addition, this research contributed to the literature by highlighting how ERP affects both functional and local accountant roles. Carlsson-Wall et al. (2021) found that cloud-based ERP encourages a bean counter role while reducing the opportunity for a business role. This research found that the integration of cloud-based ERP with other IT solutions in HMC facilitated both the functional and business partner roles, contradicting the conclusion of Carlsson-Wall et al. (2021).

Furthermore, the work of Oppi and Vagnoni (2020) highlighted clinical managers' resistance to identity hybridization, as the accounting information system examined did not provide the clinical managers with the required information for control. In addition, the accounting information system outlined by Oppi and Vagnoni (2020) encouraged the bean counter role of management accountants rather than the business partner role as it is oriented toward the governmental role. However, the present case study demonstrated that ERP generates an area of mutual knowledge between medicine and finance through the integration and transparency of data. In addition, it allows accountants to achieve a balance between the bean counter and business partner roles, leading them to support the medical divisions and balance the dual logic in clinical managers' identities. Thus, these findings responded to the suggestion made by Oppi and Vagnoni (2020) of exploring information systems that meet both extra- and intra-organizational demands.

In addition, the findings contradicted the case outlined by Carr and Beck (2020),

in which clinicians worked against managerial controls as the required information for their budgets was unavailable and their views were not considered. This research revealed that at HMC, clinical managers are involved in budgeting, their views are considered, and transparent information is available through ERP. Accordingly, this responded to the suggestion made by Carr and Beck (2020) to explore the factors that affect and encourage the engagement of clinicians in control practices.

Furthermore, this thesis contributed to the institutional logic perspective theory by presenting empirical evidence on how multiple institutional logics—ERP, clinical, and accounting—might co-exist. It also added to this research area by responding to other researchers' suggestions, as discussed above. In addition, the study contributed to the understanding of accountability practices from two distinct groups: medical and finance professionals. Furthermore, it contributed to Stewart's (1984) arguments on the accountability ladder by providing empirical evidence from different professions within the healthcare sector.

7.3. Research limitations and future research

This study has a number of limitations. First, the research was conducted during the COVID-19 pandemic, which made data collection complicated, especially from such a busy and vital organization during this critical period. Thus, the interviews were conducted by phone due to the sensitivity of medical facilities during COVID-19, with outsiders not allowed to visit the facilities as a precautionary measure. However, two participants were interviewed face-to-face outside the medical facilities. This situation also made three of the interviewees uncomfortable due to the absence of visual communication, which affects trust building. This increased their conservatism in expressing their perceptions, despite the assurance of anonymity. As a result, one interview was excluded due to the lack of useful information obtained.

In addition, meeting with clinical professionals is generally difficult due to the time pressures in such environments, since the priority is always patients' lives, especially during the COVID-19 pandemic. Accordingly, the time for the interviews was limited. In addition, it was challenging to find participants in finance, which reduced the amount of data from this side of the organization and negatively impacted the balance of the research sample. With the exception of one finance interviewee, there was no opportunity for follow-up interviews. Furthermore, it would have been better to begin with an interview with a member in the IT department to obtain a comprehensive and clear view of the information system at HMC. Additionally, the original intention was to obtain views from those on the frontline—such as physicians and nurses—who are not engaged in management. Moreover, it was not possible to extend the timeframe devoted to data collection and conducting more interviews with finance professionals as this is a thesis study restricted to a limited timeframe, which is not a unique problem among such studies. For better results, additional views from those in finance and from frontline clinicians will be required.

Despite the limitations outlined above, this thesis contributed to management accounting research, accountability literature, NPM studies, and healthcare management by providing subjective insights from a particular context. Accordingly, the findings are transferable for judgments in future research. Additionally, future research may be conducted in other Arab countries, exploring the healthcare reforms and implementation of NPM in the healthcare sector, as well as investigating ERP and other specialized systems in Arab/GCC countries' public healthcare sector, given the large gap in the knowledge discussed in Chapter 2. This would enrich the literature, providing new insights and making the results comparable and transferable.

This thesis found hybridity in clinician managers' identities. Thus, a future study

could increase the number of institutional logics by involving frontline perspectives along with those of clinician managers and finance professionals. In other words, future research may be designed to consider three different logics and explore how they respond to managerial mechanisms and collaborate with each other in light of ERP technology. In addition, future research could provide findings from other contexts and extend or challenge this study's conclusions to enrich such debatable issues. Furthermore, future studies could extend this research by exploring extra-organizational relationships through data collection from third parties for additional triangulation.

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APPENDIX A: INTERVIEW GUIDELINES

Interview questions guidelines

1. General Questions:

1.1 Could you please brief me on your current position, education and experience?

1.2 Could you please tell me what you know about this information system (IS)?

1.3 Have you been involved in implementing current and/or past IS? If yes, can you tell me about any differences that you realized when you shifted to the current system? Which one do you prefer?

1.4 To what extent current IS providing the hospital with full integration? If yes, to what extent the current system facilitates the work across departments? How?

1.5 To what extent are current IS helpful and beneficial?

1.6 Could you please tell me any challenges you have encountered while you are working on it?

2. Physicians / Unit Managers:

2.1 To what extent do/did current IS influence or influenced by your role/ responsibilities/ activities?

2.2 Could you please brief me on how physicians' performance is evaluated?

2.3 To what extent Performance Measurement System (PMS) changed with or without IS? How? Is there Any difference with previous system?

2.4 To what extent new/current PMS become tougher or easier in line with current IS?

2.5 To what extent current IS help you to receive information/ accounting information that you need for decision making? In terms of (performance evaluation/ costing / budgeting/ supply chain management).

3. Accountants:

3.1 To what extent current IS influence or influenced by your role/ responsibilities/ activities?

3.2 Do you think that IS is supporting or complicating accounting activities? How? As an accountant, how does this system affect your work?

3.3 Is it affecting any activities in accounting? (reporting/ Analysis/ Costing/ budgeting/ supply chain management) How?

3.4 How does IS help you to communicate information/ reports to units' managers, physicians, or other users?

3.5 To what extent IS has changed the organizational relations among accountants, unit managers and/or physicians? (In terms of smoothing the flow of data, on-time information).

APPENDIX B: QATAR UNIVERSITY-INSTITUTIONAL REVIEW BOARD (QU-IRB) APPROVAL

Qatar University Institutional Review Board **QU-IRB**
QU-IRB Registration: IRB-QU-2020-006, QU-IRB, Assurance: IRB-A-QU-2019-0009

Final Approval January 12, 2021

Dr. Sameh Ammar
College of Business and Economics
Qatar University
Phone: +974 4403 6759
Email: sammar@qu.edu.qa

Dear Dr. Sameh Ammar,

Sub.: Research Ethics Expedited Approval
Ref.: Student, Fatema Hammad / e-mail: fm1806236@student.qu.edu.qa
Project Title: "The impact of Enterprise resource planning (ERP) systems on Accounting: A case study from healthcare sector in Qatar"

We would like to inform you that your application along with the supporting documents provided for the above project, have been reviewed by the QU-IRB, and having met all the requirements, has been granted research ethics **Expedited Approval** based on the following category(ies) listed in the Policies, Regulations and Guidelines provided by MOPH for Research Involving Human Subjects. Your approval is for one year effective from January 12, 2021 till January 11, 2022.

1) present no more than minimal risk to human subject, and
2) involve only procedures listed in the following category(ies).
Category 6: Collection of data from voice, video, digital, or image recordings made for research purposes.
Category 7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Documents Reviewed: QU-IRB Application Human Subject-editedandsigned-3, Updated checklist, Proposal HMC Fatema Hammad, HMC approval, MRC Exemption, Interview Questions Guidelines, Interview Consent Form HMC, QU-IRB Review Forms, responses to IRB queries and updated documents.

Please also note that expedited approvals are valid for a period of **one year** and renewal should be sought one month prior to the expiry date to ensure timely processing and continuity. Moreover, any changes/modifications to the original submitted protocol should be reported to the committee to seek approval prior to continuation.

Your Research Ethics Expedited Approval Number is: **QU-IRB 1444-EA/20 Final**. Kindly state this number in all your future correspondence to us pertaining to this project. In addition, please submit a closure report to the QU-IRB upon completion of the project.

Best wishes,
Dr. Ahmed Awaisu
Chairperson, QU-IRB

Institutional Review Board
(IRB)
Office Of Academic Research

Qatar University-Institutional Review Board (QU-IRB), P.O. Box 2713 Doha, Qatar
Tel +974 4403-5307 (GMT +3hrs) email: QU-IRB@qu.edu.qa

APPENDIX C: HAMAD MEDICAL CORPORATION (HMC) APPROVAL

12/28/2020

RECEIVED 26 JAN 2021 Corporate Medical Administration

مؤسسة حمد الطبية
Hamad Medical Corporation

HMC Corporate CMO Approval Form		
Initial Information		
Title of Study	The impact of Enterprise resource planning (ERP) systems on Accounting: A case study from healthcare sector in Qatar?	
Principal Investigator Name	Ms. Fatema Muslem Hammad	
HMC Investigators	Mr. Abdulqadir Jeprel Japer Nashwan , Ms. Fatema Muslem Hammad	
Contact Details	Phone No: 30099990	Email Id: fm1806236@qu.edu.qa

Site Details	
Type of Request	New Study Application
Project type	Clinical Research
Is there any prospective recruitment of patients to study, collection of samples or data from human subjects?	Yes
Departments Used	All Departments
Summary of Tasks to be undertaken at this Hospital	interviews
Other Hospitals to be used in this study	Other
Is the Scheme of Delegation list complete and signed?	Yes

ClinicalGovernance	Reviews
Hospital Governance	
The hospital is satisfied with the clinical governance arrangements for this project	Yes
The HRO confirms that the clinical governance has been completed and signed by the relevant departments as per sites listed in the study protocol	N/A
Does the objective of this study comply with the Hospital policies	Yes
The hospital has the Capacity & Capability to deliver this study.	Yes

Approval
Recommendation: Approved

1/2

12/28/2020

Medical Director's Name: Dr. Abdulla Ali Asad Al Ansari

Medical Director's signature: **Date:** _____

A. Aziz

Dr. Abdulaziz Al Darwish
Deputy Chief Medical Officer
For Clinical Affairs & Auditing
002334 - HMC

25/01/2021

APPENDIX D: THE COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI) PROGRAM

CITI PROGRAM

Completion Date 22-Nov-2020
Expiration Date N/A
Record ID 39452911

This is to certify that:

Fatema Hammad

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

CITI Health Information Privacy and Security (HIPS)
(Curriculum Group)
CITI Health Information Privacy and Security (HIPS) for Students and Instructors
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Ministry of Public Health, Qatar

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wbcdbbd14-cdec-4497-8426-946321192410-39452911

APPENDIX E: CONSENT FORM

"Interview Consent Form"

Research project title: ***"The impact of Enterprise resource planning (ERP) systems on Accounting: A case study from healthcare sector in Qatar"***

Research investigator/ Student: Fatema Hammad

Research Participants: …….

Thank you for agreeing to be interviewed as part of the study which is approved Qatar University Institutional Review Board with the approval number **QU-IRB 1444-EA/20 Final**; If you have any question related to ethical compliance of the study you may contact them at QU-IRB@qu.edu.qa.

ERP is an integrated information system that encompass and integrate most/ all of functions of the organization and allow the users to manage day-to-day activities. It is one of the most important technology today for most of the institutions regardless of their size or specialty. Particularly, it plays a vital role in organizations (e.g. hospitals) that have large number of departments and actors with divergent perspectives and backgrounds. The purpose of this study is to investigate the impact of enterprise resource planning (ERP) in healthcare sector from both the perspectives of medical and administrative profession. Also, this research will shed the light on the effect of ERP on the relationship between medical and economic logic.

Ethical procedures for academic research require that interviewees explicitly agree to being interviewed and how the information contained in their interview will be used. This consent form is necessary for us to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Would you therefore read the accompanying information sheet and then sign this form to certify that you approve the following:

- We do not anticipate that there are any risks associated with your participation. Also, results will be reviewed by experienced researchers to eliminate any unexpected confidentiality/privacy-related risks.
- The interview will take (45-60 minutes).
- The interview will be recorded by mobile, and transcript will be produced.
- You have the right to stop the interview or withdraw from the research at any time and recorded conversation will be destroyed immediately.
- You will be sent the transcript and given the opportunity to correct any factual errors.
- The transcript of the interview will be analyzed by "Ms. Fatema Hammad" as research investigator
- Access to the interview transcript will be limited to the student, supervisor and other researchers who might collaborate as a part of the research process.
- Any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymized so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify yourself is not revealed.
- All personal information or identifiers such as names, e-mails, phone numbers, etc. will be removed so that you cannot be identified.
- The actual recording will not be reused in future and will destroyed once the study submitted.
- Data will be used for the research purposes only and stored in protected files with password known by researcher and supervisor only.
- Any variation of the conditions above will only occur with your further explicit approval or a quotation agreement could be incorporated into the interview agreement

Quotation Agreement

With regards to being quoted, please initial next to any of the statements that you agree with:

	I agree audio recording for the conversation.
	I wish to review the notes, transcripts, or other data collected during the research pertaining to my participation.
	I agree to be quoted directly.
	I agree to be quoted directly if my name is not published and a made-up name (pseudonym) is used.

By signing this form, I agree that;

1. I am voluntarily taking part in this project. I understand that I don't have to take part, and I can object to answer any question, pause the recording or stop the interview at any time.
2. During interview, the conversation will be audio-recorded.
3. The transcribed interview or extracts from it may be used as described above;
4. I have read the Information sheet;
5. I don't expect to receive any benefit or payment for my participation;
6. I can request a copy of the transcript of my interview and may make edits I feel necessary to ensure the effectiveness of any agreement made about confidentiality;
7. I have been able to ask any questions I might have, and I understand that I am free to contact the researcher with any questions I may have in the future.

Participants Signature & Date

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Researcher Signature & Date

……

Contact Information:

This research has been reviewed and approved by the ***Qatar University Institutional Review Board.***

If you have any further questions or concerns about this study, please contact:

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