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# Strategies for Applying Electronic Health Records to Improve Patient Care and Increase Profitability

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This is to certify that the doctoral study by

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Abstract

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MS, Lasell University, 2013

BS, Bay State College, 2011

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Ineffective strategies to implement electronic health record keeping systems can negatively impact patient care and increase expenses. Hospital administrators and primary care physicians care about this problem because they would be penalized for not meeting meaningful use guidelines. Grounded in the information systems success model, the purpose of this qualitative multiple case study was to explore electronic health record (EHR) implementation strategies primary care physicians use to improve patient care and increase profitability. The participants comprised five primary care physicians involved in the effective implementation of an EHR application in the central coast region of California. Data were collected from semistructured interviews, company documents, and EHR systems. The collected data were analyzed using the six-step thematic process, and four themes emerged: (a) end-user training, (b) meaningful use, (c) EHR acceptance, and (d) communication. A key recommendation is for leaders of EHR applications to support efficient end-user training, follow meaningful use guidelines, use effective communication, and embrace EHR acceptance. The implications for positive social change include the potential for enhancing the quality of patient care and increasing profitability, which will benefit healthcare organizations and the communities where they are located.

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Dedication

I dedicate this doctoral study to my mother, Rose Jeanty, and grandmother, Florina Noel, who stood by me through all my challenges. I dedicate this study to my entire family and friends. You all have given me wonderful support as I completed this doctoral study. Thank you all from the bottom of my heart.

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Section 1: Foundation of the Study

Primary care physicians have been a growing focus within healthcare industry, literature, and academia. Primary care physicians significantly influence patient outcomes, safety, and profitability (Arndt et al., 2017; Pelland et al., 2017). Researchers have shown that the quality and efficiencies of electronic health records (EHRs) documentation is vital to the quality of the interactions between primary care physicians and their patients (Arndt et al., 2017). Street et al. (2018) and Arndt et al. (2017) noted that deficiencies in EHRs decrease the resources of physicians, specifically in terms of time and quality of work, forcing them to exert more effort on EHR-related work than patient-related tasks. Because primary care physicians have a significant influence on patient outcomes, management must address potential roadblocks that primary care physicians face in patient interactions.

In this qualitative multiple case study, I explored EHRs documentation strategies used by primary care physicians in the healthcare industry to improve the quality of interactions with patients and to increase profitability. This section of the paper begins with the background of the problem. This section is followed by the problem statement and purpose of the study. Following this, I discuss the nature of the study, research and interview questions, and theoretical framework. Following that, operational definitions, assumptions, limitations, delimitations, and the significance of the study are outlined and further discussed. I conclude the section with a literature review and summary.

**Background of the Problem**

Primary care physicians are key actors and drivers in the healthcare industry. Researchers have shown that primary care physicians are at increased risk of burnout and stress due to multiple tasks and responsibilities (Khairat et al., 2018; Street et al., 2018). Primary care physicians not only interact with patients, but they also perform EHR-related tasks. Reports have shown that the majority of physicians' working time is spent on EHR-related tasks; physicians can spend 6 hours performing EHR-related tasks out of a 12-hour shift (Arndt et al., 2017). There has been limited research about the EHRs documentation strategies primary care physicians can use to improve the quality of interactions with their patients and to increase profitability (Arndt et al., 2017; Street et al., 2018). Addressing this gap in the research is vital given that primary care physicians can be negatively affected by inadequate EHRs documentation that results in loss of profitability. The lack of EHR documentation strategies also can lead to decreased face-to-face interactions with patients, thereby impacting overall patient care outcomes (Khairat et al., 2018).

As previous researchers have pointed out, patient care and healthcare organizational profitability depend on information systems and strategies used by physicians (Pelland et al., 2017; Rahman, 2019). Researchers have shown that effective information systems and strategies play a significant role in healthcare organizations, impacting patient care outcomes and business profitability (Rahman, 2019). Today's healthcare management and leaders should be able to understand the potential roadblocks that primary physicians face regarding EHRs to improve the quality of interactions with

their patients through EHR software. Addressing such roadblocks is vital given the perceptions of diminished quality of the interaction between physicians and their patients result from poor EHRs (Pelland et al., 2017).

Primary care physicians require adequate and effective strategies for EHRs. Focusing on specific strategies to improve patient safety and quality of healthcare through EHRs can lead to better healthcare organizational practices. In this research study, the aim was to explore the EHR documentation strategies some primary care physicians use in the healthcare industry to improve the quality of interactions with their patients and to improve profitability. The findings of this study could contribute to current knowledge regarding ways to increase quality of physician–patient relationships, enabling improved quality of healthcare and benefiting patients, patients' families, and communities.

**Problem Statement**

Physicians face difficulties in interacting with patients due to deficiencies in EHR documentation, leading to diminished quality of physician–patient interaction (Arndt et al., 2017; Gidwani et al., 2017). Deficiencies in EHR systems also can cause stress and burnout among physicians (DiAngi et al., 2019; Downing et al., 2018). There is a lack of knowledge on how primary care physicians' work and well-being can be improved through the enhancement of EHR systems (Gardner et al., 2019). The general business problem is that primary care physicians are negatively affected by inadequate EHR documentation, resulting in decreased profitability. The specific business problem is that

some primary care physicians lack EHR documentation strategies to improve the quality of physician–patient interactions and to increase profitability.

## Purpose Statement

The purpose of this qualitative multiple case study was to explore EHR documentation strategies primary care physicians use in the healthcare industry to improve the quality of interactions with their patients and to increase profitability. The targeted population consisted of five primary care physicians from two healthcare organizations in the central coast region of California who have had successful experiences in using EHRs to maintain profitability. The implications for positive social change include the potential to improve the quality of interactions between primary care physicians and patients, create more efficient EHR software, improve patient care, and increase the reliability of healthcare systems for communities.

## Nature of the Study

The three research methods are quantitative, qualitative, and mixed (Mertens, 2014; Yin, 2018). Yin (2018) defined qualitative study as a method to study phenomena and participants' experiences, perspectives, and processes. Therefore, a qualitative method was suitable for this study because I was exploring the experiences of the research participants. Scrutton and Beames (2015) defined the quantitative method as a method to obtain statistical data for testing hypotheses. A quantitative method was not appropriate for this study because I was not using statistical data to test hypotheses. The mixed-methods approach is appropriate when a researcher intends to use both qualitative and quantitative approaches (Palinkas, 2014). The mixed-methods approach was not

appropriate for this study because both hypothesis testing and statistical analysis were not necessary for addressing the purpose of this study. Therefore, I used the qualitative research method for the exploration of EHR documentation strategies used by some primary care physicians in the healthcare industry to improve the quality of interactions with their patients and to increase profitability.

I considered four qualitative research designs for a qualitative study on strategies for improving EHRs documentation: (a) ethnography, (b) narrative inquiry, (c) phenomenology, and (d) case study. Ethnography is a design that researchers use to explore a culture or a part of a culture, groups, neighborhoods, or organizations through a researcher's long-term involvement and research in a setting (Yin 2017). Ethnography was not appropriate because the focus of this study was not on cultural issues but solutions to a specific business problem. Narrative researchers present an in-depth description of real-life experiences of events or phenomena through the stories or personal views of research participants (Sharpiro, 2016). The narrative design was not suitable because I did not intend to study the life experiences of an individual or a group of persons; I was focused on strategies for improving a specific business problem. Researchers use a phenomenological design to capture the worldviews and lived experiences of individuals relevant to phenomena (Letourneau, 2015). Bernard (2016) described phenomenology as a philosophy of knowledge that emphasizes direct observation of phenomena. In this study, I did not use the phenomenological design because I was not studying the meanings of the lived experiences of individuals, but the

EHR documentation strategies that physicians use to improve the quality of interactions with patients and to improve profitability.

Ethnography, narrative inquiry, and phenomenology were discarded because none entailed the use of flexible methods and tools to comprehensively answer a research question based on the interconnectedness of phenomenon and natural context. The research design I used for this research was a case study. Yin (2014) defined case study as a design that requires multiple types and sources of data such as archival records, direct observations, and interviews. A case study design is best to use for exploring unknown aspects of a phenomenon that is naturally occurring in everyday life (Yin, 2014). I chose a multiple case study and not a single case study because the unit of analysis would be two organizations where primary care physicians are employed. A multiple case study also allows a researcher to explore the subject phenomenon in various situations and identify similarities and differences among many cases (Yin, 2018).

## Research Question

What EHR documentation strategies do physicians in the healthcare industry use to improve the quality of interactions with their patients and to improve profitability?

## Interview Questions

1. What strategies did you use to ensure that you selected a suitable EHR application for your practice?

2. What was the desired goal for the EHR system on your practice?

3. Based upon your organization's experience, what were the key challenges to EHR implementation?

4. What strategies did you use to achieve positive implementer and user attitudes toward improving EHR documentation quality?

5. What strategies do you use to protect your EHRs information quality?

6. What EHR documentation strategies do you use to improve profitability?

7. What EHR documentation strategies have you found to be useful for improving profitability?

8. What else can you share with me about the EHR documentation strategies you use to improve the quality of interactions with your patients and increase profitability?

## Conceptual Framework

DeLone and McLean proposed the information systems success model (ISSM) in 1992. Delone and Mclean used this model to assess information systems success in supporting system quality, service quality, information quality, user satisfaction, individual impact, and organizational impact. An updated model incorporated six interconnected dimensions: (a) information quality, (b) system quality, (c) service quality, (d) intention to use, (e) user satisfaction, and (f) net benefits (DeLone & McLean, 2002). The ISSM was applicable to this study because it provided a framework for the interpretation of the findings by underscoring the interconnectedness of information technology with other aspects of the work process involved in a given system (DeLone & McLean, 1992). As applied in this study, the use of ISSM could facilitate an understanding of the strategies that primary care physicians use to apply EHRs to improve patient care and to increase profitability.

**Operational Definitions**

*Balance scorecards*: A method for assessing the success of information systems (Nassar et al., 2015). The method was introduced by Kaplan and Norton (1992) and consists of four perspectives: (a) learning, (b) innovation, (c) internal process, and (d) customer. The use of balanced scorecards helps users define particular goals for each of the four perspectives, define measures to track progress in relation to those goals, and define projects meant to help in achieving those goals (Khiew et al., 2017).

*Clinical informaticist*: A person who designs, analyzes, evaluates, and implements communication and information systems that increase population- and individual-level outcomes for health, while also improving patient–clinical relations and patient care (Garner et al., 2009).

*Electronic health records (EHRs)*: Electronic records composed of patients' personal and historical information, such as demographics, medications, laboratory test results, diagnosis codes, and procedures (Yadav et al., 2018). EHRs aim to improve caregivers' decisions and patients' outcomes (Blumenthal & Tavenner, 2010).

*Health information technology*: An information processing method in which computer software and hardware are used for use, sharing, retrieval, storage, and entity of healthcare information (Lyles et al., 2015).

*Information systems success model (ISSM)*: The model, first developed by DeLone and McLean (1992), is used to assess information systems success in supporting system quality, service quality, information quality, user satisfaction, individual impact, and organizational impact. This model is composed of six interconnected dimensions: (a)

information quality, (b) system quality, (c) service quality, (d) intention to use, (e) user satisfaction, and (f) net benefits (DeLone & McLean, 2002).

*Key performance indicator (KPI) dashboards*: Used to enable the standardization of procedures and processes in healthcare to obtain more efficiency and transparency across the organization (El Morr & Ali-Hassan, 2019). KPI dashboards are used as strategic indicators concerning the status of a process and used to focus on trend lines rather than movement toward goals already specified (Mariani et al., 2016).

*Lean Six Sigma*: In the context of the healthcare industry, this is a system driven by metrics used to remove defects and decrease medical errors from care delivery processes (Improta et al., 2019). Lean Six Sigma consists is focused on removing waste focused on decreasing variation through the reduction of defects in line with a particular statistical measure (Antony et al., 2018).

*Physician burnout*: Refers to a psychological state resulting from chronic workplace interpersonal stressors experienced by physicians (Patel et al., 2020). Burnout is characterized by doubts regarding value, accomplishment, and competence; depersonalization; and emotional exhaustion (Nori et al., 2019).

*Process mapping*: A systematic approach used for the documentation of time, activities, and steps required for the competition of a task (Morice, 2011). In the context of healthcare, process mapping is used as a tool for improving operational efficiency and quality of healthcare (Heher & Chen, 2017).

**Assumptions, Limitations, and Delimitations**

The study has a set of assumptions, limitations, and delimitations. Assumptions
are aspects of the study or certain conditions a researcher assumes and holds as true for
the purpose of the study (Wargo, 2015). Limitations are areas a researcher does not have
control over. Finally, delimitations serve as boundaries of a study, which are set by the
researcher (Wargo, 2015; Yin, 2018).

**Assumptions**

Assumptions refer to those conditions and statements that describe and form the
conduct of the research (Fellows & Liu, 2015). The first assumption of this research
study was that all participants would answer the questions with openness and honesty.
The second assumption was that all individuals would be compatible participants of the
study with respect to the research question; all participants would have adequate
knowledge to answer the interview questions. The third assumption was that each
participant would have experience as a physician in the healthcare industry and as a user
of EHR documentation systems.

**Limitations**

Limitations refer to the constraints in relation to a study's scope and its findings
(Fellows & Liu, 2015). The first limitation of this research was related to the participants'
knowledge. This study was limited by the participants' knowledge of EHR
documentation strategies used in the healthcare industry to improve the quality of
interactions with patients and to improve profitability; each participant may have had a
different degree of knowledge or experiences of EHR documentation strategies. The

study also was limited by my preexisting bias and knowledge on the topic given my background as a clinical informaticist. To mitigate this bias, I employed a second researcher who reviewed and corroborated the research questions, recorded the interview process, and created a document trail so that any independent and outside analyst could follow how the data were gathered and analyzed. Lastly, the scope of the study could have been limited to the type of healthcare business or location, as rules, laws, and protocols vary.

**Delimitations**

Delimitations are characteristics determined by the researcher. These set boundaries and limit the scope of a study (Simon & Goes, 2011). This study was delimited to the central coast region of California. The study was delimited to a certain number of physicians and hospitals within the area. Moreover, the study was also delimited to interview questions that specifically focus on EHR documentation strategies physicians use to improve the quality of interactions with patients and to improve profitability.

<div align="center">

**Significance of the Study**

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**Contribution to Business Practice**

The significance of this study was the potential for the identification of different strategies in business practice for improving the quality and efficiencies of EHR documentation with concomitant increases in primary care physicians' profitability. Through the knowledge gained from this study, business leaders may gain a deeper understanding of how to address potential roadblocks that primary physicians face in

improving the quality of interactions with their patients through EHR software. The

results of this research could provide unique qualitative support to improve business

practices through EHR systems for improving the quality of the interactions between

primary care physicians and their patients.

**Implications for Social Change**

The results of this qualitative multiple case study may contribute to positive social

change by improving safety and quality of healthcare and could offer information to other

healthcare organizations seeking to improve the quality of primary care physicians'

interactions with their patients and to increase profitability. Given the perceived

diminished quality of the interactions between physicians and their patients as a result of

EHRs (Pelland et al., 2017), the results of the study could be instrumental in enhancing

quality of physician–patient relationships through improved quality of healthcare

benefiting patients, patients' families, and communities.

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**A Review of the Professional and Academic Literature**

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The purpose of this qualitative multiple case study was to explore EHR

documentation strategies primary care physicians use in the healthcare industry to

improve the quality of interactions with their patients and to increase profitability. In this

section, I explain the process of identifying relevant literature along with the conceptual

framework. This section also focuses on a review of literature related to the strategies

used by primary care physicians in the healthcare industry to improve the quality of

interactions with their patients and to increase profitability. The review of literature also

includes the ways in which EHR documentation strategies impact physicians, quality of

physician–patient relationship, and profitability. Next, the details of the framework based on DeLone and McLean's (1992) ISSM are presented with discussions about effective strategies used by those in healthcare roles and ways these strategies influence the well-being of physicians, the quality of physician–patient relationships, and organizational profitability.

**Identifying Relevant Literature**

With the objective of a robust literature search, I accessed the Walden University library to locate applicable databases in relation to the topic of study. I used and searched Thoreau multidatabase and other relevant databases. This helped certify and guarantee added control over the literature search and results of more accurate articles and sources.

Specific online databases and search engines used were Google Scholar, ERIC, Global Health, Ingenta Connect, JSTOR, Journal Storage, EBSCOhost Online Research Databases, and Journal Seek. The key search terms and combination of search terms obtained from online databases were the following: *electronic health records, electronic health records documentation strategies, information systems success model, patient-physician relationship, patient outcomes, profitability of hospitals,* and *strategies to increase patient outcomes*. By searching these relevant key terms, the aforementioned database search engines provided relevant literature with respect to the problem statement and research question.

Other resources were also relevant. These other resources included (a) websites related to ISSM, (b) strategies of EHR documentation systems, and (c) research groups focusing on the topic. This expanded literature search strategy enabled a wider scope of

relevant sources of statistics and reliable information in relation to the topic of EHR

systems and implementation strategies in healthcare settings. Given the significance of

reliability, I ensured that the resources used were peer-reviewed to guarantee scholarly

rigor. Achieving this objective entailed searching for journals in Ulrich's Periodical

Directory (Ulrich's Web, 2019).

The majority (above 85%) of sources reviewed had publication dates between

2016 and 2021. Articles related specifically to EHR strategies, the impact of EHRs, and

the ways EHRs improve patient care and increase profitability in healthcare settings.

Prioritization of peer-reviewed sources that met the rigor of scholarly standards was

crucial. Commonly, reviewing the literature can lead to further searches based on key

terms, concepts, and prior sources.

**Table 1**

*Frequency and Percentage of Literature Review Sources*

|  | Frequency | Percentage |
| --- | --- | --- |
| Books | 6 | 6% |
| Peer-reviewed articles | 128 | 85% |
| (128 of articles published after 2016 – 85%) | | |
| Industry and government sources | 8 | 8% |
| Doctoral dissertations | 1 | 1% |
| Total references in the study | 128 | 100% |
| Literature review section statistics | | |
| Books | 2 | 2% |
| Peer-reviewed articles | 85 | 96% |
| (90 of articles published after 2016 – 96%) | | |
| Industry and government sources | 2 | 2% |
| Total references in the literature review | 98 | 100% |

**Information Systems Success Model**

I selected the DeLone and McLean's (1992) ISSM as a conceptual framework for this study by facilitating understanding of the strategies that primary care physicians use to apply EHRs to improve patient care and to increase profitability. ISSM is relevant to assessing information systems success, and this model helped form an appropriate conceptual framework for this study in which I explored the EHR documentation strategies used by some primary care physicians in the healthcare industry to improve the quality of interactions with their patients and to increase profitability.

The conceptual framework used was based on DeLone and McLean's (1992) ISSM. I used this model to assess information systems success in supporting system quality, service quality, information quality, user satisfaction, individual impact, and organizational impact. The updated model involves six interconnected dimensions: (a) information quality, (b) system quality, (c) service quality, (d) intention to use, (e) user satisfaction, and (f) net benefits (DeLone & McLean, 2002). The use of ISSM was appropriate in the context of this study as it helped form a framework for the interpretation of the findings; researchers have underscored the interconnectedness of information technology with other aspects of the work process involved in a given system (DeLone & McLean, 1992). As applied in this study, the use of ISSM could facilitate the understanding of strategies that primary care physicians use to apply EHRs to improve patient care and to increase profitability.

Researchers have used ISSM in the evaluation of information systems because it provides a robust understanding of information systems and methods of success (DeLone

& McLean, 1992). Within ISSM are six dimensions crucial to information systems

success: (a) system quality, (b) information quality, (c) service quality, (d) use, (e) user

satisfaction, and (f) net benefits (DeLone & McLean, 1992). *System quality* refers to the

desirable characteristics of an information system. This includes the ease of use, system

adaptability, reliability, and ease of functioning and learning, as well as response times

(DeLone & McLean, 1992). *Information quality* refers to the desirable characteristics of

the system outputs. This includes the system's relevance, understandability, accuracy,

conciseness, completeness, understandability, currency, timeliness, and usability (Petter

et al., 2008). The third dimension is *service quality*, which is the quality of the support

that system users receive from the information systems support team. This includes areas

of responsiveness, accuracy, reliability, technical competence, and empathy of the

information systems support staff (DeLone & McLean, 1992; Petter et al., 2008). The

fourth dimension is *system use*, which is the degree and approach in which staff and

customers use the capacities of the information (DeLone & McLean, 1992). System use

dimension examples include the amount of use, frequency of use, nature of use,

appropriateness of use, extent of use, and purpose of use (DeLone & McLean, 1992).

*User satisfaction* is another dimension of ISSM, in which the focus is on the users' level

of satisfaction with websites, outputs such as reports, and the system's support services

(DeLone & McLean, 1992). The final dimension is *net benefits*, which refers to the extent

to which information systems are adding to the success of individuals, teams,

organizations, industries, and countries (DeLone & McLean, 1992). The metrics for this

dimension specifically includes improvements in decision-making, increases in

productivity, increases in sales/revenue, decreases in costs, increases in profits, market efficiency, consumer welfare, creation of jobs, and economic development (DeLone & McLean, 1992, 2016; Petter et al., 2008). All these dimensions of the ISSM are vital aspects to consider in the exploration of EHR strategies in the healthcare industry and their impact on patient care and profitability.

All six dimensions are vital aspects to consider in conducting a robust assessment of information systems success. The six dimensions are not independent success measures but, rather, are interdependent variables (DeLone & McLean, 1992; Petter et al., 2008). As such, within the ISSM, researchers have outlined that information systems success can be identified by these specific success metrics (DeLone & McLean, 1992). Figure 1 depicts the DeLone and McLean's (1992) ISSM.

**Figure 1**

*DeLone and McLean's (1992) ISSM*
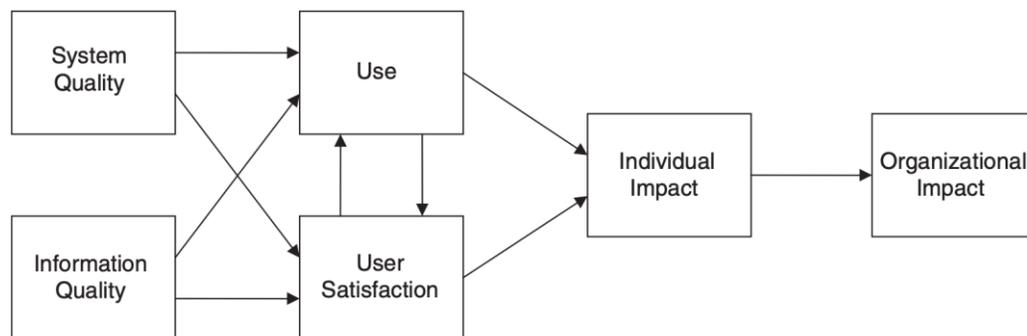


Researchers have also advanced DeLone and McLean's (1992) ISSM, emphasizing the need for better and more consistent success metrics (DeLone & McLean, 2016; Petter et al., 2008). Researchers updated the ISSM a decade later, when they

explored one or more of the relationships in the ISSM model through a quantitative

technique of meta-analysis (DeLone & McLean, 2016; Petter et al., 2008). This

advancement expanded the understanding of systems success. Figure 2 depicts the

updated DeLone and McLean (2003) model. In spite of the advancement in the ISSM,

within both the original and updated models is underscored the need for consistent and

appropriate measures for information systems success (DeLone & McLean, 1992, 2003,

2016).

**Figure 2**

*Updated DeLone and McLean's (2003) ISSM*
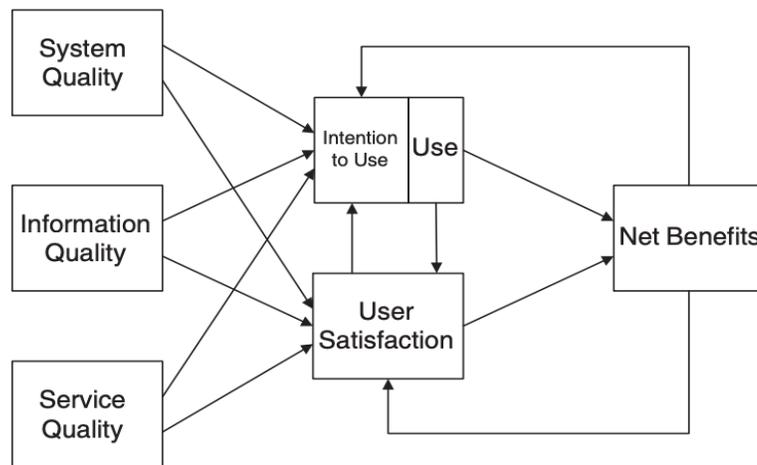


DeLone and McLean's (1992) ISSM had been used in various contexts by

different scholars seeking to determine information systems success. Daud and Fang

(2017) conducted a study that focused on investigating user acceptance of information

system modules in a given logistics program. The authors delved into this topic by

exploring the perceptions from logistics and supply chain undergraduate students.

Through the lens adopted by researchers based on ISSM, the findings revealed that

improved system quality and user satisfaction increase the rate of system use among

users (Daud & Fang, 2017). Al-Shargabi and Sabri (2016) also used the ISSM in the

adoption of cloud computing from an enterprise perspective and its impact. The authors

underscored that, in the process of adopting a new technology, systematic assessments

and evaluations are crucial, which need to be considered by an enterprise when making

the decision of adopting the new technology (Al-Shargabi & Sabri, 2016). As such, this

underscores the importance of using the ISSM in the evaluation of EHR documentation

strategies and how new technologies related to EHRs could impact patient care and

increase profitability, taking into consideration primary care physicians' perspectives

(Lin, 2017).

With the emergence of empirical research in this area and the widespread

application of the ISSM, scholars have noted the usefulness and effectiveness of the

model in exploring successful information systems in healthcare (Ibrahim, et al., 2016;

Shim & Jo, 2020). For example, Rahman (2019), who investigated the success of the

system claim payment information in healthcare contexts, noted that information systems

and strategies play a highly active role in healthcare organizations, impacting patient care

outcomes and business profitability. Their findings revealed that perceived usability of

the information system and perceived usefulness of the system for users are among the

vital success factors of an information system in the healthcare setting (Rahman, 2019).

Furthermore, with successful adoption of information systems in healthcare, the daily

operations of healthcare professionals become more efficient (Rahman, 2019) in addition

to improvement in the quality of information through the system (Ojo, 2017). Ojo (2017)

further concurred and validated the ISSM in the context of a hospital information system in a developing country. The author found that dimensions of system quality and use were the most vital measures of hospital information system success (Ojo, 2017). Through these findings, researchers have underscored the ways in which the ISSM contributes to the knowledge and evaluation of successful information systems in healthcare (Ojo, 2017; Rahman, 2019). They have also underscored the crucial role that hospital information systems play in healthcare organizations. Hospital information systems such as EHRs need to be designed in ways that are easy to use, flexible, and functional to serve their purpose (Ojo, 2017). The benefits have a positive and direct impact to the organization in terms of efficiency and profitability.

With these constructs related to the ISSM, healthcare organizations and leaders, as well as information systems leaders, may draw on this study's findings to effectively understand the aspects and dimensions that contribute to successful healthcare information systems and strategies to increase quality of physician–patient relationships and profitability. Effective EHR documentation strategies geared toward increasing quality of primary care physicians' interactions with their patients and increasing profitability may be possible through a better understanding of the potential roadblocks that primary physicians face when using EHR software.

**Impact of Electronic Health Record-Related Tasks**

EHR-related tasks comprise a large percentage of the workload of physicians in hospitals. Researchers have shown that despite the potential benefits of EHRs, policymakers and healthcare leaders need to ensure proper implementation, taking the

usability and experiences of primary care physicians into account (Scheuner et al., 2017).

Furthermore, policymakers and healthcare leaders need to acknowledge the negative

impacts of EHRs, as well as the challenges faced by healthcare practitioners in the usage

of EHRs. For instance, it has been reported that physicians spend at least 2 hours on her-

related tasks for every hour of direct patient care (Arndt et al., 2017). Arndt et al. (2017)

delved into this topic further among evaluated primary care physicians' workloads with

the aim of determining the allocated time of physicians within EHR. With the use of EHR

event log information and time-motion observations, the authors conducted a

retrospective cohort study among 142 family medicine physicians (Arndt et al., 2017).

The results showed that primary care physicians spend an average of nearly 6 hours of an

11.4-hour workday in the EHR every weekday per 1.0 clinical full-time equivalent,

which is 4.5 hours during clinic hours and 1.4 hours after clinic hours (Arndt et al.,

2017). These findings can be used to obtain initial empirical information regarding the

impacts of EHR systems in healthcare settings and various clinical environments. The

following section includes further in-depth knowledge regarding this topic with the aim

of providing robust strategies for applying EHRs to improve patient care and increase

profitability.

### *Increased Workload*

EHR-related work comprised different types of tasks for physicians. Researchers

have found that physicians constantly juggle numerous, and various amounts of workload

relating to patient care, administrative tasks, and EHR-related tasks (Arndt et al., 2017;

Henriksen et al., 2019). Aside from face-to-face patient care, primary care physicians also

perform various clerical and administrative tasks, which include documentation, order entry, billing and coding, and system security (Arndt et al., 2017). The clerical and administrative tasks comprise almost one half of the total EHR time, on average, while inbox management comprises almost one fourth of the time spent regarding EHR-related tasks (Arndt et al., 2017). Henriksen et al. (2019) added to these findings, analyzing the documentation of EHR related tasks. The authors conducted their study using secondary EHR data, including 123,274 progress notes. Their findings showed that the majority of the EHR data documentation entries were comprised of new patient notes (68%) and return patient notes (83%) ;(Henriksen et al., 2019). Based on these findings, one can obtain an outline of the tedious task required of EHR data documentation process, which takes up a significant amount of physician working time (Arndt et al., 2017; Henriksen et al., 2019). Using these findings as a reference or baseline, one could develop strategies that could help enhance the process of EHR documentation. Exerting more effort on this topic could have implications for quality of care and patient-provider relationships, as well as improved physician wellbeing outcomes.

EHR documentation took a significant amount of time in healthcare delivery. Researchers have shown that physicians exert and allocate increasingly long hours and efforts in EHR-related tasks, which diminishes the amount of face-to-face patient care (Tai-Seale et al., 2017; Young et al., 2018). Therefore, researchers have uncovered mixed impacts of EHR on the outcomes of primary healthcare. Tai-Seale et al. (2017) explored this topic further, exploring physician work effort on EHR related tasks. Using patterns of physicians' time allocation over 31 million EHR transactions, the researchers showed that

among 471 primary care physicians, 765,129 patients' EHRs were accomplished at an

average of 3.1 hours during office hours while allocating a daily average of 3.2 hours on

desktop medicine (Tai-Seale et al., 2017). Activities of EHR documentation includes

patient communication through a patient portal, replying to patients' online requests,

ordering tests, exchanging staff messages, and verifying patients' test results (Tai-Seale

et al., 2017). Young et al. (2018) delved into this topic further and observed physicians in

a total of 982 visits. The authors aimed to measure factors of total visit time, pre-visit

chart time, face-to-face time, non-face time, out-of-hours EHR work time, and total EHR

work time (Young et al., 2018). Like the findings of Tai-Seale et al. (2017), Young et al.

(2018) found that a significant amount of physicians' time was devoted to EHR,

specifically prior to entering the room and during outside of normal clinic operational

hours. The increased amount of time allocated to activities of EHR documentation

diminishes face-to-face patient care and visits. From this body of literature, one can

underscore the conclusion that physicians spend a significant amount of time working in

the EHR rather than spending in face-to-face time with patients (Tai-Seale et al., 2017;

Young et al., 2018). As such, based on these findings, one can understand the need to

provide strategies for EHR-related tasks, which could help improve face-to-face patient

care and visits, as well as physician workload.

The increased workload resulting from EHR related tasks of physicians have

resulted in decreased productivity. Several authors have noted that there are significant

time requirements for EHR use in healthcare settings (Dong, 2018; Read-Brown et al.,

2017; Sinsky et al., 2016). Further researchers have found that EHR documentation has

resulted in decreased patient-physician relations (Read-Brown et al., 2017; Sinsky et al., 2016; Zulman et al., 2016). Read-Brown et al. (2017) noted this in their study's findings, exploring 27 ophthalmologists who used EHR. The authors measured three activities: EHR use, conversation, and examination. Their findings showed that 6.3 minutes was the average examination time per patient. Out of the 6.3 minutes, 27% of the examination time was allocated to the use of EHR (Read-Brown et al., 2017). Further, 42% of the examination time was allocated to conversation while 31% was allocated to the actual examination (Read-Brown et al., 2017). More importantly, they showed that there is a positive correlation between EHR use and billing level while a negative correlation was found between EHR use per encounter and clinic volume (Read-Brown et al., 2017). These findings can be used to obtain further empirical insights that EHR use not only diminishes face-to-face patient care time, but also results in decreased clinic volume and billing levels, which was also found by other authors (Jabour, 2020; Sinsky et al., 2016). Sinsky et al. (2016) reported similar findings and focused on exploring time allocation of physician time in ambulatory practice. The authors conducted a time and motion study during office hours and after office hours to explore this topic further among 57 physicians. After a 430-hour observation, they revealed that during office hours, only 27% of total physicians' work hours were spent on face-to-face patient care while 49.2% of total physicians' work hours were allocated to EHR related tasks and clerical desk work (Read-Brown et al., 2017). This disparity in physicians' work hours were similarly found after office hours; that is, physicians often worked one to two hours' worth of time due to EHR related tasks (Read-Brown et al., 2017). These findings can be used to further

underscore the disparities in physicians' work hours, which need to be focused on face-to-face patient care. The current time spent on EHR related tasks needs to be addressed and decreased through EHR strategies, which physicians can use as reference to increase their face-to-face patient care time. This finding further merits the need for the current study.

### *Burnout*

Burnout among physicians was increasingly common. In fact, researchers have shown that physician burnout still continues to rise in recent years (Downing, et al., 2018; Micek et al., 2020). According to Read-Brown et al. (2017) and Downing et al. (2018), EHRs have various benefits especially with regards to improved patient care. However, the excessive use of EHRs and documentation completion also have negative effects, specifically among physicians and their wellbeing (Payne, 2019; Privitera & Attalah, 2018). Researchers have noted how EHR related tasks have significant impacts on physicians, specifically on their stress levels and overall well-being (Arndt et al., 2017; Downing et al., 2018; Yen et al., 2019). Micek et al. (2020) explored this topic in their study, exploring physician burnout and timing of EHR use. The authors of the study aimed to investigate the association between physician burnout and timing of EHR use through an observational cohort study. With the use of cross-sectional and retrospective data, the authors measured burnout levels and EHR time among primary care physicians (Micek et al., 2020). In the findings of their study, they revealed that the use of EHR is statistically significant and associated to burnout, especially when used during in-clinic sessions (Micek et al., 2020). This pool of findings can be used to present empirical

findings regarding the prevalence of burnout among physicians wherein the use of EHR is statistically associated and implicated as a major cause of burnout. The presence of burnout can be used to further underscore the need to provide and develop strategies for EHR tasks, which could diminish the burden and stress levels among physicians. Creating strategies for EHR tasks could potentially reduce burnout among this cohort.

There are further scholars who have attributed physician burnout to EHR use. Several authors have noted that EHR use has significantly and negatively impacted the work-life balance and burnout among the physician population (Robertson et al., 2017; Shanafelt et al., 2016). Robertson et al. (2017) explored this topic further and explored the effects of EHR use among primary care residents and teaching physicians. The authors of the study surveyed 585 primary care residents and physicians, using logistic regression analysis to analyze the data. In their results, they revealed that 37% were experiencing burnout with 75% of participants attributing burnout to the use of EHR (Robertson et al., 2017). The levels of burnout were correlated to the use of the HER; wherein, the respondents spent more than six hours every week due to EHR related tasks (Robertson et al., 2017). This is vital to address given that work-life satisfaction also decreases along with burnout due to the use of EHR (Robertson et al., 2017). Shanafelt et al. (2016) underscored similarly, as the authors explored the relationship between clerical burden and characteristics of the electronic environment with physician burnout and satisfaction. The authors surveyed 6,375 physicians regarding the topic and found that physicians who used EHRs had lower satisfaction rates (Shanafelt et al., 2016). These findings can be used to underscore that the amount of time spent on EHRs and clerical

tasks are not only associated with higher levels of burnout, but it is also significantly

associated with physicians' satisfaction (Shanafelt et al., 2016). In line with the effects

that are stress and burnout, researchers have also revealed that the use of EHR predicts

the frustration levels of physicians (Gardner et al., 2019). This is vital to address given

that daily frustration increases the risk of physician burnout by 2.4 times as compared to

physicians who do not have frustrations regarding the use of EHR (Gardner et al., 2019).

These findings can be used to underscore that there is much room for improvement of the

use of EHR among physicians, especially given that overall physicians' satisfaction is at

a low while burnout rates are at a high with the use of EHRs. Thus, while there are

benefits to the use of EHR, healthcare administrators and leaders need to be mindful of

the negative impacts of excessive EHR use, which include negative effects on physicians'

satisfaction and burnout levels. As such, more attention is necessary in terms of strategies

that physicians could use for EHRs.

Physician burnout is also manifested through the prevalence of emotional fatigue.

This has resulted to an increasing number of physicians leaving the workforce (Downing

et al., 2018; Tran et al., 2019). Therefore, this issue of physician burnout is vital to

address, as this could present a major threat to the industry healthcare in ensuring a

sufficient number of professionals to address healthcare needs in the United States.

Downing et al. (2018) added, with the rise of EHR adoption in the U.S, more research is

needed on ways to alleviate the risk of physician burnout in the EHR era. Tran et al.

(2019) explored this topic further and noted that EHR use is a significant factor that leads

to burnout and emotional fatigue among primary care physicians. With significant

clinical workloads, the authors argued that primary care physicians need to be supported

through less allocated time of EHR use (Tran et al., 2019). Tran et al. (2019) underscored

this in their cross-sectional study, exploring levels of self-reported burnout among 107

faculty physicians. The authors found that physicians who spent more time in the EHR

had increased risks of burnout. In their results, they also revealed that physicians' burnout

was associated with EHR use, which increased their overall workload (Tran et al., 2019).

Therefore, healthcare leaders and policymakers need to consider the burnout factors of

physicians given the significant workload they have daily. These burnout factors include

the use of EHR, which can be used to underscore the need for more strategies that

physicians can utilize to better manage their workload and mitigate their risks of burnout

(Downing et al., 2018; Tran et al., 2019).

Physician stress and burnout are related to the use and adoption of health

information technology in hospitals. Researchers have noted that the use of EHR is also

prevalent at home and outside of work hours, which significantly contributes to the stress

levels and burnout among physicians (Gardner et al., 2019; Privitera & Attalah, 2018;

Ramrakhiani & Shetler, 2019). This topic was vital to address and explore further given

that in one study by Gardner et al. (2019), 26% of physicians reported burnout while 70%

reported EHR-related stress, especially among physicians in primary care-oriented

specialties. Gardner et al. (2019) noted this in their study's findings, exploring the ways

in which health information technology impacts and health information technology

burnout among physicians. Employing 4,197 physicians, the authors conducted a survey

regarding the use of health information technology and self-reported burnout (Gardner et

al., 2019). Through the findings of their study, they showed that several factors contribute

to the stress and burnout of physicians: lack of time for documentation and excessive

time spent on the EHR at home (Gardner et al., 2019). In fact, the factor of lack of time

for documentation increased the likelihood of physician burnout by 2.8 times while the

factor of excessive time spent on the EHR at home increased the likelihood of physician

burnout by 1.90 times (Gardner et al., 2019). Privitera and Attalah (2018) noted similarly

as the authors explored the use of EHR at home. The authors explored survey answers

from 1,048 physicians regarding the time spent using EHR at home and found that

physicians' moderately high to excessive time spent on EHRs at home significantly

increased their odds of job stress by 50% and burnout by 46% (Privitera & Attalah,

2018). Specifically, tasks related to EHR such as documentation requirements, and

completion of recording and phone calls at home were found to increase the risk of

physician burnout (Privitera & Attalah, 2018). This pool of knowledge can be used to

underscore the need to address the issue of lack of time for documentation, as well as the

use of EHR at home (Gardner et al., 2019; Privitera & Attalah, 2018).

Overall, EHR related tasks have been found to be significantly associated with

increased workload, increased risks of burnout and frustrations, as well as decreased

professional satisfaction. Researchers have shown in their findings that primary care

physicians spend a significant number of hours, nearly 6 hours, with respect to EHR

related tasks during and after clinic hours (Arndt et al., 2017). EHR strategies are needed

to address the problems of workload and issues of burnout, which are currently prevalent

among the physician population (Downing et al., 2018; Gardner et al., 2019). Therefore,

more efforts are needed to provide ample amount of time for physicians to finish

documentation tasks, including the ways in which to control the amount of use of EHR at

home (Henriksen et al., 2019; Micek et al., 2020). Targeting these key points of health

information technology could decrease and mitigate the prevalence of physician stress

and burnout.

**Strategies for Electronic Health Records**

EHRs are widespread in the U.S, as they are widely utilized in clinics, hospitals,

and across medical practices nationwide. This is due to the provision of the American

Recovery and Reinvestment Act of 2009, which mandated the use of EHRs across all

healthcare organizations in the U.S by 2015 (Balestra, 2017; Barrett, 2018; Barrett &

Stephens, 2017). Failure to comply with this mandate resulted in medical reimbursement

penalties, and these penalties have increased with each year of noncompliance (Barrett,

2018). As a result of the passing of this act, there has been an increase in the usage of

EHRs within healthcare settings in the U.S. With the increased prevalence of EHRs,

strategies are needed to ensure the effectiveness of EHR adoption (Balestra, 2017).

Several authors have called out the need for strategies relating to the use of EHR systems,

as current issues face EHR use in healthcare settings, including time-consuming nature of

EHR, diminished patient interactions, and medical errors (Balestra, 2017; Mosaly et al.,

2018). Application of these strategies is essentially for optimal benefits from the

implementation of EHR systems across healthcare settings.

Outlining strategies for the use of EHR systems could help address these issues

and ensure increased quality of patient care, increased efficiency, improved physician

wellbeing outcomes, and overall reduced costs. Researchers have noted that strategies for the use of EHR systems need to be standardized across healthcare professions, supporting patient-physician communication, inter professional communication in healthcare, and patient care outcomes (Bardach et al., 2017; Balestra, 2017). Barrett and Stephens (2017) and Adeyemi (2017) similarly called out the need for strategies that help ensure EHR implementation success and lower resistance to EHR change among healthcare practitioners and physicians. Barrett and Stephens (2017), for one, noted that strategies related to engagement of employees and overall satisfaction need to be considered when implementing systems of EHR to ensure its effectiveness within healthcare communicative processes (Barrett & Stephens, 2017). This pool of findings could be used to obtain initial empirical information corroborating the need for EHR implementation strategies in healthcare organizations to ensure their effectiveness. Addressing the need for strategies that physicians and healthcare practitioners can implement could result in efficient navigation and utilization of EHRs within healthcare systems in the U.S, positively impacting patient care outcomes and physician wellbeing outcomes.

There are various challenges faced by physicians in the use of EHRs. Researchers have shown that physicians struggle with productivity and usability in EHR systems (Hribar et al., 2018; Matthews, 2017). Matthews (2017) noted that despite the rapid rates of EHR documentation implementation, more meaningful strategies are needed that address the need of efficiency of physicians. This is especially true given the fact that physicians have a wide range of responsibilities, which add to their workload, in addition to EHR-related tasks (Arndt et al., 2017; Gardner et al., 2019). Matthews (2017) explored

this topic among 37 behavioral health providers using EHRs during face-to-face patient visits. Through the findings the researcher showed that environmental, relational, and system related strategies are needed to efficiently implement and integrate EHRs into healthcare systems, especially during treatment and face-to-face patient encounters (Matthews, 2017). Similarly, Hribar et al. (2018) underscored that EHR documentation practices and strategies in the outpatient setting need to be further reviewed. In the outpatient setting, physicians report a low number and percentage of notes reviewed, indicating that a large percentage of content in the EHR is not being utilized by clinicians (Hribar et al., 2018). These researchers, however, did not explore and determine which specific strategies for EHR documentation are best for addressing the needs of both physicians and patients. This pool of information, thus, can be interpreted as a call for the need for further exploring of documentation practices and strategies, as this could help yield better EHR designs and improved information with respect to the needs of both physicians and patients. As such, these findings could be used to demonstrate the need for the current study in exploring strategies for applying EHRs to improve patient care and increase profitability.

Use of strategies that are consistent and standardized are vital to the effectiveness of EHR documentation. According to Cohen et al. (2019), when the EHR documentation process varies from one physician to another, negative clinical status of patients might occur, which are harmful to the patient outcomes. Several authors explored this topic further and aimed to analyze variations of strategies for EHR documentation (Cohen et al., 2019; Friedman & Banegas, 2018). Friedman and Banegas (2018) also underscored

the need for more standardized strategies in healthcare systems. The authors noted that an integrated healthcare delivery system, specifically for EHR, is vital in addressing patients' social determinants of health and outcomes (Friedman & Banegas, 2018). The authors thus concluded the need to further develop and provide EHR-based tools that are standardized, providing measurable and actionable patient data that could be utilized to address the identified needs of our patients (Friedman & Banegas, 2018).

In this regard, organizations can use multiple tools to enable the standardization of procedures and processes to obtain more efficiency and transparency across the organization. Some of these tools include the utilization of Balanced Scorecards and Key Performance Indicator dashboards. The use of Balanced Scorecard is a method for assessing the success of information systems success as part of the ISSM (Nassar et al., 2015). The method was introduced by Kaplan and Norton (1992) with the goal of enabling organizations the ability to balance their financial assessments with their non-financial assessments. The Balanced Scorecards consists of four perspectives, namely learning, innovation, internal process, and customer (Kaplan & Norton, 1992). Balanced Scorecards allows users to obtain alignment across teams regarding organizational goals (Ratnaningrum et al., 2020). The use of Balanced Scorecards helps users define particular goals for each of the four perspectives, to define measures in order to track progress in relation to those goals, and to define projects meant for help in achieving those goals (Khiew et al., 2017). Additionally, the use of Balanced Scorecards allows users to provide wide overview of the efficiency with which the organization is moving in relation to the strategic plan, in terms of adherence and execution (Khiew et al., 2017).

Following the establishment of measurable, definite goals, users are able to easily assess

whether their strategy is effective or is met with hurdles (Pham et al., 2020). The

transparency enabled through this process also assists employees in understanding the

way in which their role aligns with the wider goal of the organization (Nassar et al.,

2015). While balanced scorecards initially began in the context of the private sector, it is

now used across government organizations, nonprofit, and healthcare (Nassar et al.,

2015). In the context of healthcare, researchers have contributed research involving the

use of the balanced scorecards since the latter half of the 1990s (Nassar et al., 2015). The

utilization of balanced scorecards involves adoption as a tool for evaluation regarding

care quality, clinical pathways, performance measurement, and health programs.

Researchers have used Balanced Scorecards across various health informatics including

EHR and electronic medical record (Khiew et al., 2017; Nassar et al., 2015).

*Key performance indicator* (KPI) dashboards are also used to enable the

standardization of procedures and processes in healthcare to obtain more efficiency and

transparency across the organization (El Morr & Ali-Hassan, 2019). KPI is differentiated

from Balanced Scorecards as the latter are used to assess performance metrics over larger

time periods of quarters, months, and weeks. KPI dashboards, on the contrary, are used

for tracking performance in smaller periods of days, hours, and minutes (Nassar et al.,

2015). KPI dashboards are used as strategic indicators concerning the status of a process

and as opposed to Balanced Scorecards, are used to focus on trend lines rather than

movement towards goals already specified. Business intelligence systems at healthcare

organizations generate dashboards that are used by administrators at hospitals to obtain

data regarding several KPIs from different sources at the organization with the goal of attaining a wider understanding of the processes at the organization (Mariani et al., 2016). Through aggregation of data, users can attain efficiency at their organizations via real-time snapshot of the performance of the hospital and understanding of actions taken proactively (Mariani et al., 2016). Further, administrators to focus on specific KPI information to trace and remove the fundamental hurdles resulting in inefficiency performance (El Morr & Ali-Hassan, 2019).

KPIs can be divided into multiple types, including clinical, operational, and financial (Bharath et al., 2020). Operation type of KPIs affect productivity among employees and performance among patients (Bharath et al., 2020). Some of the KPIs within this type include medication errors, patient wait times, average length of stays, and asset utilization rates (Bharath et al., 2020). Financial type of KPI affect both bottom and top line. KPIs within this type include payor performance, physician performance, hospital performance, referrals to outside centers, expense incurred by hospitals, and physician performance (Bharath et al., 2020). Effective KPI dashboards enable performance tracking through providing real-time access to dashboards that are rich in information from multiple hospital departments and are accompanied by functionalities for escalation as well as support for decision (Bharath et al., 2020).

Other tools for increasing efficiency at hospitals include enterprise resource planning software (ERP), process mapping, and Lean Six Sigma. ERP refers to a technological software involving specific modules that are developed to track data and make communication between various organizational departments more efficient (Kontio

et al., 2014). The use of ERP helps employees work more productively and efficiently. In the context of healthcare, the use of ERP systems helps improve the delivery speed of services related to healthcare (Kontio et al., 2014). The use of ERP in hospitals results in more efficiency patient care, as the use of an ERP allows details regarding patients to be transferred and stored between an organization's departments (Kontio et al., 2014). Thus, even when data are moved, their accessibility can be ensured. Further, updated data can be made available. Accessibility to data helps doctors provide better care (Kontio et al., 2014). Additionally, the electronic storage of data related to health made possible through ERP allows confidentiality and safety, reducing the risk of loss of data (Kontio et al., 2014). ERP also provides information more efficiently that can be used by organizational administrators to make key decisions regarding patient visit analysis, requisitions, and budgeting transparently and efficiency (Kontio et al., 2014). Administrators can also identify areas requiring further improvement and focus on them. Through the use of ERP, operations of the hospital can be streamlined, allowing better integration between such departments as billing, finance, inventory, and human resources (Kontio et al., 2014).

Process mapping is another tool organizations can use for improving quality. A process map consists of a diagrammatic representation regarding the action sequences for a particular activity (Heher & Chen, 2017). Using a process map, users are able to visualize as well as explain the steps that are part of a process. Process mapping consists of symbols, which can denote different elements depending on their shapes (Heher & Chen, 2017). Endpoints and starting points are represented through oval shapes, while actions are represented through rectangle shapes (Heher & Chen, 2017). Waiting is

represented through inverted triangles, while decision points are represented through diamonds (Heher & Chen, 2017). Arrows and lines link symbols, helping highlight the direction and interaction of the processes (Heher & Chen, 2017).

In the context of healthcare, process mapping is a tool for improving operational efficiency and quality of healthcare (Heher & Chen, 2017). The advantages of using process map are multiple. Process mapping helps avoid the challenges related to redesigning and workflow analysis associated with standard operating procedures that are generated in the format of narratives (Heher & Chen, 2017). In this regard, the use of process mapping helps understand processes rapidly and efficiency through visualization, as graphs register more rapidly in the human mind compared to written and oral format (Heher & Chen, 2017). Additionally, as a hospital consist of various departments, processing mapping allows integration across different members of the team via visual diagram (Heher & Chen, 2017). Limitations associated with existing workflow, identified through processing mapping, helps deploy interventions in a timely manner (Heher & Chen, 2017). Without easy measurement, no process can be improved. The process of developing process maps requires brainstorming between different members of the organization, which results in consensus building (Heher & Chen, 2017). Through availing these advantages, the use of process mapping has become an important part of quality improvement at hospitals.

Lean Six Sigma is another process used in healthcare industry to achieve improvements in operations (Improta et al., 2019). Lean Six Sigma is a system driven by metrics that is utilized to remove defects and decrease medical errors from care delivery

processes. Lean Six Sigma is used to make operations efficient and enhance value for the customers (Henrique & Godinho Filho, 2018). Lean Six Sigma consists of Lean, focused on removing waste, and Six Sigma, focused on decreasing variation through the reduction of defects in line with a particular statistical measure (Antony et al., 2018). Lean Six Sigma is thus a combination of two systems to achieve a single improvement process for organizations (Improta et al., 2019).

The Lean Six Sigma consists of a five-step approach for improving processes, namely Define-Measure-Analyze-Improve-Control (DMAIC). Through its implementation, eight wastes are eliminated as part of the Lean process (Improta et al., 2019). These include reduction of idle time, which is the time a patient or worker has to spend waiting. Examples include patients waiting in waiting areas, latecomers stalling meetings, and waiting lists for appointment. The second waste is related to inventory (Henrique & Godinho Filho, 2018). Examples include surplus medications and supplies, extraneous data, and superfluous equipment. Another waste is defects that need to be removed to improve care quality. These include medical mistakes, system failures, and misdiagnosis (Improta et al., 2019). Another waste is transportation (Henrique & Godinho Filho, 2018). These include reducing the patient, equipment, and supply movement. Another waste to reduce is related to motion, which takes place when workers carry out movement that do not add value to customers. Examples include frequently stopping for equipment and supplies (Improta et al., 2019). Another waste is related to overproduction (Antony et al., 2018). These include developing medications for patient who has been discharged, duplicate tests, and overextended stays at the hospital.

Overprocessing is another waste (Antony et al., 2018). Examples include tests that are not needed and filling of forms containing duplicate data. The Six Sigma that reduce variation include focusing always on the patient, understanding the way work takes place, ensuring processes smoothly flow, decreasing waste and focusing on value, preventing defects by eliminating variation, collaboration, and systematization of efforts (Improta et al., 2019).

Cohen et al. (2019) aimed to determine the causes and effects of variation and strategies of EHR documentation with the objective of mitigating negative effects. The authors of the study conducted a sequential, explanatory, mixed methods study, using semistructured interviews among 40 physicians. After conducting multilevel linear regression analysis, they showed that documentation strategies varied in terms of discussing results, assessment and diagnosis, problem list, review of systems, and social history (Cohen et al., 2019). These variations were due to the varying user preferences of EHR systems and designs. They also showed that variations of documentation were due to the option of multiple places to record similar information (Cohen et al., 2019). This resulted in documentation inefficiencies, and consequently, increased risk of patient harm due to inaccurate or misinterpreted information (Cohen et al., 2019). That is, this body of findings can be used to underscore the need for more standardized strategies for EHR systems and designs, which could help decrease the risk of patient harm.

Other researchers have underscored the need for improved EHR documentation through standardization. Cromwell et al. (2018) concurred to the findings of Cohen et al. (2019) and Friedman and Banegas (2018), as the authors conducted a retrospective study

with the aim to improve postoperative documentation through standardization. In their

study, data were gathered from 100 patients who underwent recent surgery in the past

five weeks wherein the authors developed an educational tool to improve postoperative

documentation (Cromwell et al., 2018). After the standardized postoperative

documentation plans were in place, in the results the researchers reported significant

improvements in the quality of postoperative surgical documentation (Cromwell et al.,

2018). Specifically, all documentation standards improved quality of documentation for

patient identification (17.8% vs 78.1%, $p < 0.001$) and name of note maker (54.7% vs

86.2%, $p < 0.001$) (Cromwell et al., 2018). In the results, the researchers also showed

significant improvements in the documentation quality of antibiotic use (23.8% vs 75.8%,

$p > 0.001$), thromboprophylaxis (7.1% vs 75.8%, $p < 0.001$), analgesia (36.9% vs 74.7%,

$p < 0.001$), operative diagnosis (66.6% vs 91.9%, $p < 0.001$), and mobilization (23.6% vs

78.1%, $p < 0.001$) (Cromwell et al., 2018). Gold et al. (2018) further concurred,

investigating the EHR-related strategies centered on enhancing patients' social

determinants of health. Like past authors, Gold et al. (2017) noted that substantial health

benefits can only be found through the development of EHR-based tools that are

standardized. With focus on standardized data collection and presentation, the authors

collaborated with 27 stakeholders to develop strategies for optimizing data collection and

presentation in their EHR (Gold et al., 2017). In the findings of their study, the

researchers showed that providing standardizing SDH data collection and presentation in

EHRs leads to significant quality improvements of data collection, as well as patient and

population health outcomes in healthcare settings (Gold et al., 2017). These findings can

further be used to highlight the need for standardized documentation strategies, as well as educational training for physicians as users of such documentation tools and strategies (Cohen et al., 2019; Cromwell et al., 2018; Gold et al., 2017). Overall, there is a need that strategies for EHR documentation and implementation are facilitated to focus on user training during implementation stages and documentation standardization.

As a strategy to enhance EHR documentation, the pre-visit planning framework has been proposed as an effective way to enhance outpatient care and quality. Authors Lorenzetti et al. (2018) and Bose-Brill et al. (2018) outlined how advance care planning effectively enhances the EHR system, yielding multiple benefits such as less aggressive care and fewer hospitalizations. Lorenzetti et al. (2018) further added to this, noting how pre-planning can help reduce errors and plan for resource allocation activities for primary care physicians. Bose-Brill et al. (2018) further outlined that with the patient portals and EHR systems currently available, advance care planning or pre-visit planning allows physicians to deliver more efficient planning and workflow that is focused on enhancing quality of patient care. The authors found this in their pilot study, testing the advance care planning delivery framework in their study. The authors evaluated the results of pragmatic trial in two clinical sites, one site with the implementation of the strategy/program while the other without. In the findings of their study, the researchers showed that advance care planning or pre-visit planning enhances the overall quality of advance care planning documentation (Bose-Brill et al., 2018). In their findings, they further revealed that the clinical site where the intervention was implemented yielded statistically significant increases in new advance care planning documentation rates, as

well as quality among patients who engaged in the pre-visit planning interventions (Bose-Brill et al., 2018). Specifically, EHR documentation rates through pre-visit planning increased by 105% (Bose-Brill et al., 2018). Among patients aged from 50 to 60 years old, the advance care planning documentation rates increased by 37% (Bose-Brill et al., 2018). These findings were used to highlight the use of advance care planning pre-visit planning as a strategy for EHR documentation (Bose-Brill et al., 2018; Lorenzetti et al., 2018). This body of knowledge can be used to obtain initial empirical knowledge regarding the impact of advance care planning delivery in enhancing quality of patient care. More research is required as to the impact of this strategy on physicians' workload and efficiency, as well as face-to-face patient care time.

Goal-directed EHR systems, such as Balance Scorecard discussed previously, have been identified as effective strategies for patients and clinicians. Researchers have shown that past EHR systems in place focus on reactive patient care rather than goal directed EHR documentation (Gao et al., 2016; Nagykaldi, et al., 2018). Nagykaldi et al. (2018) noted this in their study, highlighting the need for EHRs to facilitate healthcare that is focused by patient life and health goals. As such, the authors proposed the development of strategies for EHR documentation that reflects the goals of patients and clinicians. Gao et al. (2016) also found that most of the EHR documentation systems are focused on problem-based diagnoses and practices that are reactive. The authors conducted a literature review on the topic, focusing and analyzing 24 articles for their review (Gao et al., 2016). Through the results of their study, they underscored the need for strategies of EHR documentation that focus on a holistic approach to clinical practice

and documentation using a person-centered, strength-based ontology (Gao et al., 2016).

The authors found that this focus could be used as a strategy to enhance the quality and

strengths of EHR documentation, especially with the use of standardized interface

terminology, which are in line with past findings (Cohen et al., 2019; Cromwell et al.,

2018; Gao et al., 2016). This body of findings further underscores the importance of

standardized strategies for EHR documentation, especially one that is focused on

providing holistic approaches for clinical practice and documentation. This could

mitigate the occurrences of variations in EHR documentation processes and practices.

Despite the prevalence of EHR systems in healthcare systems in the US, there is

still room for improvement regarding the tasks related to entering information into EHR.

Yazdani et al. (2019) and Wiebe et al. (2019) noted that more interventions are needed to

enhance EHR documentation. Wiebe et al. (2019), for one, emphasized that EHR

documentation is highly variable, often entailing multiple data entries such as medical

intervention, outcomes, document type, EHR users, and other variables. This aspect of

variability leads to difficulty in using EHR and evaluating the quality and effectiveness of

documentation (Kitsos et al., 2019). As such, there is a need for EHR documentation to

be standardized and more automated (Wiebe et al., 2019). Yazdani et al. (2019) also

underscored this in their study's findings, noting how the process of EHR documentation

is time-consuming, which poses a major challenge for physicians at work. The authors

thus proposed the use of automated versions of EHR documentation. That is, the authors

applied the trigram language model to develop a methodology that helps predict the next

words while typing free texts (Yazdani et al., 2019). In the results of their study, they

showed that the time to process documentation reduced after employing the words

prediction model (Yazdani et al., 2019). Specifically, in their results they indicated a

reduced time in typing by 33% and reduced time in keystroke by 74% (Yazdani et al.,

2019). This strategy could be used to help reduce the work time of physicians on EHR-

related tasks, providing more time for patient-centered treatment (Wiebe et al., 2019;

Yazdani et al., 2019). This could thus yield a better EHR system across healthcare clinics

and hospitals in the US geared towards EHRs improvement in terms of documentation

and patient care.

**Challenges of Electronic Health Record Usage**

There are various challenges related to the use of EHR systems. Several

researchers have noted that to improve healthcare electronic documentation systems,

nurses' attitudes, perceptions, and preferences need to be explored and considered in its

development and implementation (Al-Anazi et al., 2018; Hossain et al, 2019). Al-Anazi

et al. (2018) noted this in their study's findings, which was conducted using a descriptive

correlational cross-sectional design. The authors gathered data from 117 nurses in a

critical care unit (ICU) wherein semistructured questionnaires were administered (Al-

Anazi et al., 2018). In the findings of the study, the researchers showed that the majority

of the nurses' attitude indicated positive feelings towards the use of EHR systems (Al-

Anazi et al., 2018). However, the nurse respondents in the study reported the need for an

improved electronic documentation system that is more efficient (Al-Anazi et al., 2018).

This finding can be used to further highlight the need for strategies to improve the current

EHR systems, which could consequently result to better quality healthcare to patients and

improved time management for physicians. Bardach et al. (2017) concurred to these

findings by Al-Anazi et al. (2018). Like Al-Anazi et al. (2018), the authors of the study

explored the perceptions of healthcare practitioners in using electronic medical records.

Bardach et al. (2017) explored interprofessional communication, specifically, with the

presence of EHR systems through nine focus groups. Like past authors, in their findings

they showed that the presence of EHR systems has decreased the interprofessional

communication within healthcare professional groups, as well as in-person

communication to patients (Arndt et al., 2017; Bardach et al., 2017; Henriksen et al.,

2019). Through these findings, it can be further showed that participants experienced

multiple challenges in the efficient use of EHR systems, such as barriers to

communication between specialties and decreased confidence that other healthcare

practitioners had received one's notes (Bardach et al., 2017). Other found challenges

were related to limitations in technology such as lack of computer availability,

documentation complexity, and slow-moving sign-in procedures (Bardach et al., 2017).

　　　More researchers have noted the need for training to be in place during EHR

documentation. Use of targeted trainings for users have been found to increase quality of

data, improve user satisfaction, decrease EHR-use time, and decrease turnaround time on

EHR-related tasks (Denton et al., 2018; DiAngi et al., 2019). Hemler et al. (2018), for

one, underscored the need for supplemental training for physicians on the use of EHR.

The authors found this in their study, aiming to investigate strategies that are best used

for addressing EHR data challenges for quality improvement (Hemler et al., 2018). The

authors noted, without training of proper EHR usage, physicians are less likely able to

provide accurate clinical performance data. As such, training for physicians as EHR users could help set improvement priorities, guide clinical change, and monitor progress (Hemler et al., 2018; Vehko et al., 2019). Hemler et al. (2018) explored 136 facilitators and found that physicians also face numerous EHR challenges, including lack/inaccurate clinical performance data. In addition to training, facilitators also need to be in place, helping communicate the practices to EHR users/physicians (Vehko et al., 2019). The findings of Hemler et al. (2018) also concluded these findings, noting the need for facilitators who could help develop EHR strategies to develop the skills needed for physicians as EHR users. Additionally, DiAngi et al. (2019) conducted a pre-post study to explore the impact of supplemental EHR training for EHR documentation. The authors focused on academic and community practice clinicians, gathering self-reported data regarding calculated EHR time and vendor-reported metrics (DiAngi et al., 2019). The findings of their study showed that significant increases in clinicians' knowledge of tools in the EHR after training, which increased the efficiency of EHR-use time (DiAngi et al., 2019). In fact, the results showed that the most significant improvement after the supplemental EHR training was the controlled workload in the EHR; that is, clinicians were able to better manage their workload, increasing their knowledge of EHR tools and satisfaction (DiAngi et al., 2019). There is a need for further study regarding the contents of supplemental EHR training sessions for physicians, especially considering the feedback and user acceptability of physicians (DiAngi et al., 2019). This could be used to further improve turnaround time for EHR-related tasks given a better understanding of the barriers and challenges that physicians face in EHR documentation. Use of these

strategies of user training and providing facilitators could be helpful in driving quality information, ensuring accurate and complete data, which are necessary for improved patient outcomes and physician satisfaction.

These challenges of EHR usage need to be addressed, especially regarding the prevalence of resistance to change. Leaving these issues of EHR implementation and usage could result to even more barriers to the effective and timely usage and implementation of EHR systems, as well as effective communication between practitioners (Al-Anazi et al., 2018; Bardach et al., 2017; Samhan & Joshi, 2017). Barrett (2018) concurred, noting that resistance to the mandate of EHR implementation is still prevalent in healthcare systems. Delving further into this topic, the author conducted a survey among 345 employees in a healthcare organization with recent EHR implementation (Barrett, 2018). Through hierarchical regression analyses, the researchers in their findings indicated that the quality of communication with regards to EHR implementation was associated with EHR resistance (Barrett, 2018). That is, multiple barriers such as resistance to change are linked to effective EHR implementation and usage (Barrett, 2018). This pool of findings can be used to underscore the multiple challenges related to the use of EHR systems, including resistance to change (Barrett, 2018). Though the use of EHR systems has presented benefits in patient care, it has also contributed to changes in patient-physician interaction and interprofessional communication within healthcare professional groups (Al-Anazi et al., 2018; Bardach et al., 2017; Barrett, 2018). As such, it is vital to address these challenges in the use of

technology in healthcare settings. The accomplishment of a goal like this may lead to improved patient outcomes and profitability.

Despite the mandate of the US government for EHR system implementation in 2015, there are still many physicians at primary care practices that have not implemented EHRs. Mason et al. (2017) and Barrett (2018) noted this in their study's findings, reporting that by the end of 2015 deadline, almost 50% of primary clinics have not implemented a basic EHR system. Mason et al. (2017) explored this topic further and aimed to investigate the barriers of implementing a basic EHR system. More specifically, the authors conducted a phenomenology study to explore rural primary care physicians and physician assistants' experiences regarding barriers to implementing EHRs (Mason et al., 2017). Through the lens of complex adaptive systems framework, the authors analyzed collected data from 21 physicians and physician assistants (Mason et al., 2017). In their findings from the interviews, they indicated various barriers and challenges faced by physicians and physician assistants in implementing EHRs: lack of finances for EHRs, health information exchange problems, lack of knowledge and education, and lack of change management at rural medical practices (Mason et al., 2017). Al-Anazi et al. (2018) added to these findings and noted that training programs and support should be provided for physicians and nurses, specifically focused on computer technology prior to implementing EHRs. This could help ensure optimal EHR documentation results, improving patient care. This body of findings could be used to provide further empirical insights regarding the challenges and barriers of implementing EHR systems. This could

be used to develop effective strategies to promote the adoption of EHRs, provide education for physicians, and enhance change management plans.

Improper usage of EHRs has been identified as a primary concern. Several authors have underscored the need to provide strategies and improvements on EHR implementations, especially with respect to system design and human use of the system (Park et al., 2017; Tubaishat, 2019). For one, Tubaishat (2019) conducted a qualitative exploratory study to explore the impact of EHRs on patient safety, as perceived by nurses. The author of the study employed 17 staff nurses who worked in various units in ten hospitals using EHRs (Tubaishat, 2019). In the findings of their study, they showed that EHRs (directly and indirectly) significantly improved patient safety, as EHRs mitigated medication errors, enhanced data documentation and completeness, and improved data sustainability (Tubaishat, 2019). However, some challenges that were raised by nurses using EHRs, the occurrences of data entry errors, technical problems, minimal clinical alerts, and poor use of system communication channels (Tubaishat, 2019). These are vital points to address as they could jeopardize patient safety and outcomes. Park et al. (2017) found similar findings, as the authors aimed to determine the barriers to electronic medical record implementation. The authors specifically conducted a comparison between ophthalmology and other surgical specialties in Canada regarding adoption of electronic medical records. Through their population-based, cross-sectional study among 1,199 surgeons, the researchers showed that there were various barriers to the adoption of electronic medical records utilization: not suitable for the practice of the healthcare professional, too costly, time-consuming, privacy concerns, reliability

concerns, and lack of training (Park et al., 2017). This body of findings could be used to

provide further knowledge on common barriers experienced by healthcare professionals

in the adoption and utilization of EHRs (Park et al., 2017; Tubaishat, 2019). This pool of

findings could also be used to outline the multiple challenges and concerns regarding

EHRs, as perceived and reported by nurses who utilize the system themselves (Park et al.,

2017; Tubaishat, 2019). As such, more efforts need to be made on addressing these issues

through targeted strategies, mostly geared towards the technological education and

knowledge of EHRs. Barriers of EHRs as perceived and experienced by healthcare

professionals need to be addressed. Barriers that are left unaddressed could result in

limiting the effectiveness of EHRs, such as human input errors, leading to decreased

patient outcomes.

Poor EHR documentation quality has been raised as a concern in healthcare

settings. Several authors have noted the need for improvements that aim to address this

barrier of EHR documentation utilization (Lorenzetti et al., 2018; Palabindala et al.,

2016; Varela et al., 2019). Varela et al. (2019) noted that there are multiple factors that

contribute to poor quality of documentation within the EHR, calling out the need to

identify and address these factors. For one, Lorenzetti et al. (2018) noted that physicians

are often challenged with time management due to the lack of interventions that aim to

address the issue of poor EHR documentation quality. The authors of the study conducted

a systematic evaluation to assess the effectiveness of approaches to improve physician

documentation (Lorenzetti et al., 2018). The authors gathered and analyzed 19 studies

related to EHR interventions to improve the quality of physician documentation. In the

findings of their study, the researchers revealed multiple problems related to the use of

EHR documentation: lack of audit/feedback, poor dictation, lack of education, lack of

pharmacist facilitation, reminders, templates, and multi-pronged interventions (Lorenzetti

et al., 2018). There is a need for future research regarding the ways to address the needs

of EHR users, as well as enhancing quality of physician documentation (Lorenzetti et al.,

2018). Palabindala et al. (2016) conducted their study also on this topic, finding that poor

EHR documentation quality is raised as one major barrier of EHR implementation and

effectiveness. The authors of the study noted that for primary care settings and within

hospitals that have invested in EHR implementation, there is a lack of administrative and

physician leadership that aims to address and identify the common risks for medical

errors, systems failure, and legal responsibility related to EHR systems (Palabindala et

al., 2016). Adding to the findings of Lorenzetti et al., Palabindala et al. (2016) noted that

physicians need to be supported through education and knowledge of their EHR-related

responsibilities, which is key to minimizing risks of poor EHR documentation quality,

risks of medical errors, as well as patient safety. This pool of findings presents further

knowledge regarding the need to provide more support for physicians in primary care

settings and within hospitals, as well as knowledge on proper EHR implementation and

documentation (Lorenzetti et al., 2018; Palabindala et al., 2016). This could help ensure

patient safety and overall increased profit for healthcare organizations, reducing the risk

of error and improving communication between patients and healthcare providers.

Barriers to medical practitioners' EHR access can impede their effectiveness in

practice. With the increasing prevalence of EHRs in healthcare settings, new graduate

healthcare practitioners must know how to access patient data and document and synthesize patient information accurately to plan safe, quality care and mitigate potential errors. Authors have called out the need for introducing EHR access for medical students to prepare them for EHR-related tasks and responsibilities (Sorensen & Campbell, 2016; Welcher et al., 2018). For example, Welcher et al. (2018) argued the need for future medical practitioners to have hands-on practice and experiences in handling documentation tasks and encounters. As such, introducing EHR-related tasks within educational programs could be used as a strategy to help prepare future students in becoming competent physicians (Welcher et al., 2018). The authors further argued that competence in the use of EHRs is most vital for students to become physicians, which can help them provide optimal patient care (Welcher et al., 2018). Sorensen and Campbell (2016) similarly proposed this in their study, noting how graduate nurses need to be knowledgeable of EHRs across all patient care settings. The authors noted that to maximize EHRs, nursing programs need to integrate the use of EHRs, focusing on quality, safety, and improving patient care (Sorensen & Campbell, 2016). Delving into this topic further, Sorensen and Campbell (2016) provided faculty members with a set of simple teaching strategies that promoted an academic EHR across the nursing curriculum. In the findings of their study, they showed that students had positive feedback and course evaluation regarding EHRs. Sorensen and Campbell (2016) further argued that experiences and programs using EHRs should be consistently integrated into the medical school curricula (Stroup, et al.,2017). More research is needed to determine how these courses for students objectively increase the knowledge of EHRs in healthcare systems

and clinical settings. That is, EHR-related skills should be further objectively evaluated

with other clinical skills to assess the impact of EHR-related courses (Sorensen &

Campbell, 2016; Welcher et al., 2018). However, this set of findings could be used to

obtain empirical reference regarding the potential effects of providing EHR-related

courses in undergraduate programs (Sorensen & Campbell, 2016; Welcher et al., 2018).

This could add to the knowledge of future healthcare practitioners, which could help

ensure ample skills and knowledge regarding EHRs. This could help improve patient care

outcomes, as well as profit and measurable outcomes.

<div align="center">**Summary**</div>

In this literature review, I presented the details of the framework based on

DeLone and McLean's (1992) ISSM. Strategies used by primary care physicians in the

healthcare industry and the ways in which EHRs documentation strategies impact

physicians were also discussed. In ISSM, the researchers underscored the

interconnectedness of information technology with other aspects of the work process

involved in a given system (DeLone & McLean, 1992). Based on the literature, it was

shown that ISSM contributes to the knowledge and evaluation of successful information

systems in healthcare (Ojo, 2017; Rahman, 2019). I also showed that EHR related tasks

are significantly associated with increased workload, increased risks of burnout and

frustrations, and decreased professional satisfaction. Primary care physicians spend a

significant number of hours, nearly six hours, with respect to EHR related tasks during

and after clinic hours (Arndt et al., 2017). Therefore, EHR strategies are needed to

address the problems of workload and issues of burnout, which are currently prevalent

among the physician population (Downing et al., 2018; Gardner et al., 2019). I also found that, despite the prevalence of EHR systems in healthcare systems in the U.S, there is still room for improvement regarding the tasks related to entering information into EHR. I also found that poor EHR documentation quality has been raised as a concern in healthcare settings, and researchers have noted the need for improvements that aim to address this barrier of EHR documentation utilization (Lorenzetti et al., 2018; Palabindala et al., 2016; Varela et al., 2019). Barriers to medical practitioners' EHR access can impede their effectiveness in practice, which can be used to highlight the need for the present study.

## Transition

Physicians in the healthcare industry face difficulties in interacting with patients due to deficiencies in EHRs (EHRs) documentation. This problem could lead to diminished quality of interaction with their patients during consultation (Khairat et al., 2018; Street et al., 2018). The general business problem was that primary care physicians in the healthcare industry are negatively affected by the inadequate EHRs documentation which results in loss of profitability for practices. The specific business problem was that some primary care physicians in the healthcare industry lack EHRs documentation strategies to improve the quality of interactions with their patients and to increase profitability.

Section 1 of this study contained the foundation of the problem and the purpose of the study. The purpose of this qualitative multiple case study was to explore EHRs documentation strategies used by some primary care physicians in the healthcare industry

to improve the quality of interactions with their patients and to increase profitability. The targeted population consisted of 10 primary care physicians from two healthcare organizations in the central coast region of California with successful experience in using EHRs to maintain profitability. In this study, I employed a qualitative method with a multiple case study design. Qualitative research methods are well suited for opened-ended and flexible approaches to explore unknown concepts. A multiple case study design was the best fit for this study instead of other qualitative designs. This is because a case study design is well suited for exploring unknown aspects of a concept that is freely occurring in everyday life. The central research question used to guide the study was: What EHRs documentation strategies do physicians in the healthcare industry use to improve the quality of interactions with their patients and to improve profitability? For this study, DeLone and McLean's (1992) ISSM served as the conceptual framework. This study was significant because I explored different strategies in business practice for improving the quality and efficiencies of EHRs documentation with concomitant increases of primary care physicians' profitability.

Section 2 of this study focuses on the methodology and design elements of the project. This section will include a focus on the role of the researcher, participants, research design, population and sampling, ethics, data collection, organization, and analysis, and reliability and validity. Section 3 contains narratives on the data analysis, results, and conclusion gathered from the findings of the study.

Section 2: The Project

Primary care physicians should be equipped with EHR documentation strategies to ensure improved quality of interactions with their patients and improved profitability. The aim of this research was to close the gap between healthcare organizations, primary care physicians, and EHRs documentation strategies. In Section 2, I focus on the research strategies and approaches used in this project. First is the purpose statement, the role of the researcher, and the participants of the study. Following are the chosen research method and design and the study's population and sampling. In Section 2, I outline the ethical standards upheld in this research and the methods used to uphold these ethical standards. Then, details on data collection instruments, techniques, organization, and analysis will be discussed. This section concludes with factors of reliability and validity and a summary.

**Purpose Statement**

The purpose of this qualitative multiple case study was to explore EHR documentation strategies used by primary care physicians in the healthcare industry to improve the quality of interactions with their patients and to increase profitability. The target population for this study included five primary care physicians from two healthcare organizations in the central coast region of California, who have had successful experiences in using EHRs to maintain profitability. The implications for social change from this study include the potential to improve the quality of interactions between primary care physicians and patients, to create more efficient EHR software, to improve patient care, and to increase the reliability of healthcare systems for communities.

**Role of the Researcher**

In qualitative research, a researcher's role should be well-defined and brief, as they are the primary instrument to gather, analyze, and synthesize the data. In qualitative research, the researcher's main objective is to evaluate the viewpoints and emotions of participants (Sutton & Austin, 2015). The role of the researcher is multifaceted; oftentimes, a researcher should seek to inquire about viewpoints and emotions that may be personal to participants (Råheim et al., 2016; Sutton & Austin, 2015). The responses from participants can vary due to their experiences. A researcher should be significantly detailed during the transcription process (Sutton & Austin, 2015).

One of the roles of the researcher is to cover and manage multiple, relevant aspects of a research project. This includes the selection of the study's methodology and design, selecting participants, and organizing, analyzing, and interpreting data (Windsong, 2018). My tasks as the researcher in this study included (a) obtaining access to study participants; (b) securing quality communication with participants; (c) structuring the research process; (d) steering the research; (e) collecting, analyzing, and interpreting the data; and (f) presenting the findings. I brought a unique perspective to this research study. I have 8 years of specialized experience as a clinical informaticist in the healthcare industry. I have had extensive experience training doctors and nurses on how to use the electronic medical records software. This experience allows me to understand basic electronic medical records strategies and basic principles while offering a fresh and untarnished perspective on EHRs. With my experience as a clinical informaticist, I was able to better interpret the primary care physicians' perspectives,

while being able to have a neutral perspective toward electronic medical record strategies. I conducted the semistructured, open-ended interviews, gathered relevant documents, and recorded all observations.

The sources of data should align with those found in qualitative research (Yin, 2014). As the researcher of this study, I maintained an unbiased position by having my chair and committee approve my research questions, recording the interview process, and creating a document trail. I did this so that any independent and outside analysis may be replicated or followed, specifically regarding the ways in which the data were gathered and analyzed. I used a systematic interview protocol (Appendix B) to keep the data collection process uniform. Also, a researcher must ensure that all data are safeguarded to protect the participants' identities. All the participants were assigned a unique alphanumeric code to ensure anonymity and confidentiality.

## Participants

Qualitative researchers establish criteria for participant eligibility to avoid ineffective data collection (Yin, 2014). Most researchers establish eligibility criteria to ensure selected participants have experience and knowledge concerning the phenomenon under study (Yin, 2017). To ensure that participants possess the requisite knowledge and experience, I established eligibility criteria for this study. The targeted population consisted of five primary care physicians from two healthcare organizations in the central coast region of California. These physicians had successful experiences in using EHRs to maintain profitability. The implications for positive social change include the potential to improve the quality interactions between primary care physicians and patients, create

more efficient EHR software, improve patient care, and increase the reliability of healthcare systems for communities.

Participants for this study were primary care physicians from healthcare organizations with successful experience and knowledge in using EHRs to maintain profitability in the central coast region of California. For this study, leaders included management and CEOs and company founders. I selected this sample of leaders to explore EHR documentation strategies used by some primary care physicians in the healthcare industry to improve the quality of interactions with their patients and to increase profitability. I selected two healthcare organizations in the central coast region of California. I selected participants based on primary care physician experience and knowledge; participants need to have at least 3 years' experience as a primary care physician in the healthcare industry. The participants had experience using EHR documentation strategies in the healthcare industry and knowledge of EHR documentation challenges and practices, and participants had to be located in the geographic location selected in California.

I crafted an introductory letter with details regarding the purpose of the research. The letters were sent to two healthcare organization CEOs as the gatekeepers to the population of the study. In the letter, I requested a scheduled phone call between the healthcare organization CEO and me so that both parties could be clear regarding the study's expectations. Upon building a good rapport, I provided the healthcare organization CEO with additional letters to distribute to their primary care physicians.

During the research project, it is important that participants feel welcomed. Participants need to feel comfortable so that a researcher can gather open and honest responses (Yin, 2018). To ensure this, participants selected the time and place of the interview, which enabled them to feel like contributors rather than subjects (Yin, 2018). Additionally, I allowed participants to corroborate and alter their responses at any point. Researchers have also noted the importance of protecting participants' identities. This anonymity helps ensure more open answers and avert possible reprisal (Flick, 2018; Sutton & Austin, 2015, Yin, 2018). As such, all the participants' names were redacted and each name was replaced with a respective alphanumeric code (e.g., A1) to maintain anonymity.

<div align="center">**Research Method and Design**</div>

I used a qualitative method with a multiple case study research design to address the study's purpose and research questions. Qualitative methods should be used when the research questions focus on finding answers of how and why (Yin, 2018). In the following section, I discuss the research method and design, providing a rationale for the selected method and design.

**Research Method**

I selected a qualitative method for this research study. Qualitative research is best used when a researcher is in the middle of the phenomenon and uses interpretive and material data to describe that phenomenon (Flick, 2018). Qualitative research studies depend on representations from the information such as (a) field notes, (b) interviews, (c) pertinent documents, and (d) observations. From the information, qualitative research

studies necessitate a naturalistic methodology, enabling interpretation of the phenomena at hand (Flick, 2018). A qualitative method is also used to collect data through in-depth details about a phenomenon (Rahi, 2017). The researcher assumes that target samples represent that group's emotions and viewpoints in a way that cannot be detailed and described by the quantitative method. As such, qualitative data is more interpretive than objective; it is used when the investigator aims to conduct observation or interpretation of an event within the contexts of its natural environment (Rahi, 2017).

The qualitative method was the best fit for this study because the focus was on subjective questions of EHR documentation strategies linked to the quality of interactions with patients and profitability. In the study, I focused on conducting interviews, researching archival documents, and noting observations as primary sources of data with no assigned numerical value. A quantitative approach would only be acceptable if the research were measuring the success of EHR documentation strategies used by physicians in the healthcare industry to improve the quality of interactions with their patients and to improve profitability. Quantitative research relies on numerical, quantifiable data to prove or disprove a hypothesis within limits of confidence (Rahi, 2017). Additionally, quantitative research is focused on describing the findings rather than interpreting the results (Yin, 2016). Because I was not focused on measuring the success rather than the participants' strategies in EHR documentation, a qualitative method was most appropriate instead of a quantitative or mixed-method approach. I did not select a mixed-methods approach for this study as there were no quantitative aspects or factors to be measured within the research study.

**Research Design**

I employed a multiple case study research design. A single case study was not best for this research because the unit of analysis was two healthcare organizations where primary care physicians are employed. Yin (2018) noted that multiple case studies are mostly found within social science areas, as well as in business professions. Case studies have a specific focus on a phenomenon bounded within a specific context and situation (Yin, 2018). The case study design depends on open-ended questions to gather responses in which a researcher has minimal control (Yin, 2018). In addition, open-ended questions are commonly used in case studies (Yin, 2018).

I used a multiple case study approach. A multiple case study design is distinct from single case studies, as more than one site is selected to provide more insights and context to the phenomenon (Yin, 2018). This type of study design allows a researcher to compare findings among groups, facilitating a cross-case analysis (Dasgupta, 2015). In contrast, a single case study is focused on a singular person or a singular group or unit to generalize a phenomenon. According to Gustafsson (2017), a single case study is less time-consuming as multiple case studies and can provide a deeper understanding of a singular subject (Gustafsson, 2017). However, multiple case studies depend on deriving data from multiple groups across a variety of participants, enabling a researcher to form a more robust set of conclusions to the study subject (Gustafsson, 2017).

Therefore, I selected a multiple case study method for this study to explore EHR documentation strategies used by some primary care physicians in the healthcare industry to improve the quality of interactions with their patients and to increase profitability.

Multiple case studies help ensure a better understanding regarding EHRs documentation strategies outside of a specific event of the phenomenon. A case is a phenomenon bounded by time and space (Gustafsson, 2017; Yin, 2018). In the current study, the phenomenon was EHR documentation strategies employed in the healthcare industry with primary care physicians as participants.

I considered other research designs, including ethnography, narrative, and phenomenology. Narrative research is focused on probing questions regarding participants' experiences and how they took place over time (Sutton & Austin, 2015; Yin, 2018). I did not select narrative research design because I was not interested in individual stories. Also, other types of study were not selected because they did not allow for understanding the strategies that primary care physicians use to apply EHRs to improve patient care and increase profitability. Researchers use phenomenological design when they aim to understand lived experiences of those directly affected by the phenomenon or those who experience it. I did not select the phenomenological design because in this study I was not aimed at understanding the lived experiences of physicians in the healthcare industry (Yin 2018). Lastly, ethnography refers to the study of observation and interaction in the real-life environments. I did not select the ethnographic design because there was no observation of daily action and event in the natural environment.

A number of methods can be used to reach data saturation, including triangulation and member checking during interviews (Fusch & Ness, 2015; Saunders et al., 2018). I used a saturation grid where gathered information derived from the participants' responses during the interviews was listed on a vertical line, then the interviews were

conducted on a horizontal one. I also included a second party to review the coding to help

ensure that data saturation was reached. Once data saturation was reached, I stopped

interviews, as the necessary information had been obtained (Fusch & Ness, 2015;

Saunders et al., 2018). For this study, data saturation occurred at the maximum amount of

five participants to ensure a wide scope of knowledge.

## Population and Sampling

In qualitative research, sampling is the process of selecting people, groups,

environments, and situations to gather data (Flick, 2018). I used nonprobability sampling

for the study. Researchers have noted that nonprobability sampling is a process in which

participants are selected and gathered in a manner where they are not given a random

chance of being selected (Etikan & Bala, 2017; Flick, 2018). Nonprobability sampling is

best used for qualitative research for selecting participants with a purpose. I used

nonprobability sampling for this study because I was deliberately choosing participants

from two healthcare organizations.

There are various options for nonprobability sampling. Quota sampling occurs

when a researcher chooses participants based on the characteristics of a major population.

The chosen group is assumed to be a proportional representation of the major population

(Etikan & Bala, 2017). However, it can be difficult to develop a specific set of

characteristics shared across all participants. With no set of specific characteristics across

participants, I did not use quota sampling for this study. Expert sampling is when a

researcher gathers expert participants as a principal data source (Etikan & Bala, 2017).

Purposive sampling is when a researcher selects participants based on their own judgment

on who can provide the best information to answer the study's research question. A

researcher needs to select participants who have the needed insight to fulfill the amount

of data needed for analysis (Etikan & Bala, 2017).

For multiple case studies, sampling six to 10 cases is suggested (Yin, 2016). To

ensure sufficient data, participants were selected until data saturation was reached, when

no more useful data are gathered upon the addition of a new participant (Fusch & Ness,

2015; Saunders et al., 2018). There are numerous methods to reach data saturation;

common methods include triangulation and member checking during interviews (Fusch

& Ness, 2015; Saunders et al., 2018). I used a saturation grid where gathered information

derived from participant responses during interviews were listed on a vertical line, then

the interviews were conducted on a horizontal one. I also included a second party to

review the coding to help ensure data saturation was reached. Once data saturation was

reached, I stopped the interviews (Fusch & Ness, 2015; Saunders et al., 2018). For the

purpose of this study, data saturation occurred at the maximum amount of five

participants to ensure a wide scope of knowledge.

Yin (2016) and Dasgupta (2015) stated that participant selection must correspond

to the research question, methodology, and design. Two healthcare organizations in the

central coast region of California. Physician participants were selected from different

areas in the healthcare industry to generate a wide range of understanding. Choosing

participants who are experienced in knowledge and practical abilities regarding the topic

at hand is important (Flick, 2018; Sutton & Austin, 2015; Yin, 2016). Participants were

selected based upon primary care physician experience wherein participants need to have

at least three years' worth of experience as a primary care physician in the healthcare industry. Participants had experiences on using EHRs documentation strategies in the healthcare industry, and knowledge of EHRs documentation challenges and practices, and be within the geographic location of California.

A formal documented procedure was developed to obtain informed consent from the participants. This document that was created in line with IRB standards can be found in the Appendix A. I crafted an introductory letter with details regarding the purpose of the research. The letters were sent out to the two healthcare organizations' CEOs as they are gatekeepers and leaders to the population of the study. The letter were first requested a scheduled phone call between the healthcare organization's CEO and researcher so that both parties can be clear regarding the study's expectations. Upon building a good rapport, the researcher provided the healthcare organization's CEO with additional letters that they will distribute to their primary care physicians.

The targeted population consisted of 5 primary care physicians from two healthcare organizations in the central coast region of California with successful experience in using EHRs to maintain profitability. Participants for the study were primary care physicians at least three years in a healthcare role, located in the central coast region of California, have considerable experiences and knowledge of EHRs documentation strategies, and are employed within a healthcare organization. Given that this is a multiple case study, the participants' field were from diverse areas of the healthcare organization rather than a singular one.

**Ethical Research**

This researcher observed Walden's ethical requirements and the guidelines of the Walden University Institutional Review Board (IRB). According to the Belmont Report (1979), a critical aspect of ethical research was to do no harm. The responsibility of the researcher was to ensure to all participants, research, and society that their research was ethical (Lune & Berg, 2016). Ethical research addresses any issues related to participants' harm, consent, privacy, and confidentiality of the gathered data (Dongre & Sankaran, 2016; Lune & Berg, 2016). This is vital to preserve the integrity of the results.

Adhering to the IRB standards and the Belmont Report guidelines were ways to minimize ethical consequences (Dongre & Sankaran, 2016; Lune & Berg, 2016). The three fundamental ethical elements for using any human subjects for research are respect for persons, beneficence, and justice (Belmont Report, 1979). In line with this, the IRB was a set of committees that are tasked to ensure ethical research, as they are charged with the responsibility of reviewing any such investigations that involve human subjects. As such, I obtained the approval of the official IRB before conducting any process of the research and secure signed informed consent forms (Appendix A). Additionally, I ensured participants' privacy and confidentiality. I also allowed the participants to review their responses to further support credibility (Silverman, 2016). Through this process, the IRB can objectively weigh the risks and benefits to the subjects, the empirical knowledge from the data, that informed consent was offered and signed, and that the rights and well-being of the participants were rightfully protected and preserved (Dongre & Sankaran, 2016; Lune & Berg, 2016).

Informed consent forms were sent to participants to sign. This is in compliance with ethical standards of research. The informed consent forms contained details regarding the study wherein the participant signs and knowingly partook in the investigation free from fraud, deceit, or duress and without any manipulation in the researcher (Lune & Berg, 2016; Yin, 2016). The informed consent form also consisted of a written statement of the risks and benefits by participating in the study. As such, potential participants were disclosed of the purpose of this study, the research procedures, data security, and participant rights (Flick, 2018; Yin, 2016). Informed consent forms were signed by both the participant and the researcher wherein they were stored for a minimum of 5 years for security, safety, and anonymity. After 5 years' time, the forms were destroyed (Lune & Berg, 2016). The researcher reached out to participants through a letter of invitation; if the participant shows interest in the study, they were then be offered the informed consent form.

Confidentiality and anonymity were vital to ethical research. Confidentiality ensures that a subject's identity is protected while anonymity ensures that the subject remained nameless (Dongre & Sankaran, 2016, Lune & Berg, 2016). To ensure this, I kept all participants' data securely and safely. First, I coded the participant's name to protect them from any repercussions from participation. This coding method ensured confidentiality (Dongre & Sankaran, 2016, Lune & Berg, 2016). Also, I did not use any of the participant's real names to ensure anonymity. As such, they were all redacted and replaced with relevant codes, referring to the participant themselves. For example, for the first participant who came from the first selected healthcare organization, the code would

be P1. Another example would be for the first participant from the second selected healthcare organization, the code would be P2. To safeguard the participants and anonymity the coding data were only kept for three years. After 5 years' time, the data will be destroyed.

No incentives or compensation were provided for participation. Participants were be made aware of their free ability to withdraw from a study at any given time, and their right to review and alter their responses accordingly (Yin, 2016). I provided my contact details to enable an open communication between the participants and myself as the researcher. I informed the participants who wish to withdraw to contact me using my communication information describing their desire to withdraw from the study. Upon receiving such message, I began the process of their withdrawal immediately and without asking for any explanation. I permanently deleted all the data collected regarding the participant who wished to withdraw till that time.

Finally, all interviews and transcripts were digitally recorded and stored in USB flash drives. After 5 years' of storage, the stored data were destroyed and deleted. The final document for this paper included Walden's IRB approval number. Also, I made sure that any identifiable information for individuals and organizations was redacted.

## Data Collection Instruments

This research focused on EHRs documentation strategies as it related to the healthcare industry. The primary data gathering instrument was semistructured interviews (Appendix C). Questions have been proposed to address the overarching research purpose. These questions focused on EHRs documentation strategies, key challenges to

EHR implementation, and the desired goal for the EHR system. There were multiple EHR documentation strategies used to improve the quality of interactions with their patients and to improve profitability. The interview questions focused on EHRs through these lenses.

As the researcher, I was the primary data collection instrument. I conducted semistructured interviews, which is the study's main source of data. I was also solely in-charge of researching and requesting relevant, important documents and recording observations throughout the research process. I also used semistructured interviews to gather the data, which interview questions to guide the interview sessions. Researchers have shown that semistructured interviews have limitations in terms of structure whereupon the wording of the questions is flexible, and the level of the language can be altered accordingly (Lune & Berg, 2016; Hatry, et al., 2015). The interview questions in this study focused on how or why the strategies worked, its outcomes, and policies (Yin, 2016). Interviews were designed to retrieve and gather participants' viewpoints (Austin &Sutton, 2015; Newcomer et al., 2015). During this process, the interviewer answers participant questions and may ask for further clarifications when necessary. Researchers altered the language and semistructured interviews accordingly to enable participant responses that are open and honest (Lune & Berg, 2016; Newcomer et al., 2015). To conduct the interviews, I used systematic interview protocol. During the interview process, I used a step-by-step protocol for conducting interviews (Appendix B). I ensured that each participant is asked the same set of questions; each response during the interview process will also be digitally recorded. Simultaneously, I took notes of

observations throughout the interview process; this enabled me to further interpret and described the participants' demeanor with respect to the interview questions (Yin, 2018).

Listing the steps of developing interview questions was vital. This was done through listing out the conceptual areas of the overall topic under investigation (Lune & Berg, 2016; Newcomer, et al., 2015). As such, as an interviewer, I reflected on DeLone and McLean's (1992) ISSM to be able to craft the interview questions. I formed interview questions from this conceptual framework. Each formed interview question was revised accordingly to yield the best possible data; that was, each question was edited for sequencing, content, and style. As such, the interview questions started with a nonthreatening question, which was still focused on the important topic of the study, then followed by sensitive questions. When necessary, follow-up questions would be used throughout the interview process to validate and clarify their answers (Lune & Berg, 2016; Newcomer et al., 2015). The interview protocol could be found within the Appendix B and contains the step-by-step approach for engaging participants.

Member checking was applied in this study. Member checking took place when participants were provided with transcript copies. The purpose of this was for the participants to review their answers and validate the authenticity of the work (Newcomer et al., 2015). As such, I employed member checking and provide my contact information so that the interviewees can participate in a transcript review. This allowed the participants to provide their feedback and revise their responses at any given time.

All interviews were recorded digitally. All interviews were also stored on a USB stick. The participants were allowed to select their preferred time and place of the

interview, which allows them to feel like contributors rather than subjects. This helped facilitate an environment where they could freely answer the interview questions more openly with honesty (Yin, 2016). Throughout the interview process, field notes and observations were noted, providing further context to the study (Mayer, 2015). Finally, I requested healthcare organizational documents regarding their EHRs documentation standards and any EHR training that they used. Through the collection of three sources of data, triangulation could take place, enhancing the validity and reliability of the research (Mayer, 2015). For the purpose of this paper, the data for triangulation was interviews, observations, and relevant archival documents.

## Data Collection Technique

To address the purpose and guiding research question for this study, I gathered primary data through semistructured interviews either in a face-to-face setting or through videoconferencing. There were benefits and disadvantages when conducting semistructured interviews. The interviewer needed to be sharp, composed, and well-informed about the topic at hand (Newcomer et al., 2015). Semistructured interviews were best used when the researcher aimed to ask open-ended questions to derive viewpoints from each individual, when the participant might not feel comfortable in a group setting, a need to understand strategies for EHRs, and further themes need to be developed (Flick, 2018; Newcomer et al., 2015). Semistructured interviews were great for probing primary care physicians about strategies used to apply EHRs to improve patient care and to increase profitability (Newcomer et al., 2015, Yin, 2016). However, one of the disadvantages to semistructured interviews was that it is extremely labor-

intensive when setting up, conducting, and analyzing. Also, the interviews could be extremely time-consuming (Newcomer et al., 2015).

The first step in conducting semistructured interviews were the selection of the participants for the study (Flick, 2018; Newcomer et al., 2015, Yin 2016). According to Yin (2016), when a participant felt like a contributor, they were more likely to answer questions honestly and openly. Thus, it was vital to respect the participants' time during the interview phase. To ensure this, I tested the questions first and measure the time it took to finish the interview phase; this process helped to ensure that the researcher was not taking up too much of the participants' time (Newcomer et al., 2015).

I first drafted the questions accordingly. Researchers have noted that it was vital to avoid cramming too many items into the agenda; this underscored the need to identify which items are critical to the data (Newcomer et al., 2015, Yin, 2016). The questions were resulted in follow-up questions of why and how (Flick, 2018). I first drafted the questions and ensure that did not lead to socially responsible answers. There was no retribution or recourse, and pressure, should the participant choose not to answer the question. During the start of the interview process, I began with easy questions to facilitate a more comfortable environment and develop rapport with the participant (Lune & Berg, 2016; Newcomer, et al., 2015). Further, I started by looking at the positive scientific topic and then follow-up with discussions of the drawbacks.

Before starting the interview, each participant was made aware of the informed consent process, the interview format, and their right to withdraw and review their answers at any point. Also, prior to any recording, all participants were requested to grant

their consent; the steps for this process are in Appendix A. During the interview process, a step-by-step protocol for conducting interviews was utilized in this study (Appendix B). I ensured that each participant was asked the same set of questions; each response during the interview process was also digitally recorded. Simultaneously, I took notes of observations throughout the interview process; this enabled me to further interpret and describe the participants' demeanor with respect to the interview questions (Yin, 2018).

To ensure validity, this researcher utilized member checking. After the interview, I provided the participants with my personal contact information. This way, participants could reach out at any time for questions or concerns. Also, the participants were informed that they participated in member checking. Member checking was when the participants reviewed and verified the interpretation of their answers within the interview process. This step helped support the validity and trustworthiness (Birt et al., 2016). Furthermore, when there was better rapport, participants were more likely to respond freely and openly. Participants were given the right to review and verify their answers to ensure that they responded in openly and honestly (Birt et al., 2016).

Triangulation was used when there are multiple types of data within the same study of the phenomenon (Lune & Berg, 2016; Flick 2018; Fusch & Ness, 2015). The study incorporated triangulation to support validity. This step of triangulation was also map out the phenomenon from multiple points of view (Lune & Berg, 2016; Flick 2018; Fusch & Ness, 2015).

Secondary data sources were also used as a source of data. This entailed gathering pertinent documents. I asked the participants whether they had any EHRs documentation

practices or documents that they would be willing to share. The researcher also explored

the healthcare organizations' websites to understand the organization's goals and values

in relation to EHRs documentation, ensuring patient care with strategies aligned to this

goal. Finally, past literature on EHR strategies may also be used to compare the data

obtained from the semistructured interviews.

## Data Organization Technique

While collecting data, I simultaneously took notes of observations throughout the

interview process, which enabled me to further interpret and describe the participants'

demeanor with respect to the interview questions (Yin, 2018). Following data collection,

I stored all gathered data in a password-protected laptop. Also, I secured the data in a

USB stick that was securely maintained in a safe. I stored the signed hard copies of the

informed consent forms within the safe. Only I, as the researcher, had sole access to the

safe and password-protected laptop. The USB stick contained the audio files for the

interviews, participant coding, and transcriptions. The password-protected laptop

contained pertinent documents and observations from the interview process. The

protection of identities of the participants is important to ensure confidentiality and

participated-researcher trust (U.S. Dept of Health & Human Services, 1979). Therefore,

all participants were assigned a code name or pseudonym to ensure confidentiality and

trust. In line with IRB regulations, all data was destroyed after 5 years.

## Data Analysis

For data analysis, I used a thematic analysis for this research study. Yin (2018)

outlined a five-step process, which begins with (a) compiling the data, (b) take apart the

data, (c) reunite the data, (d) interpret the data, and (e) present the data. Thematic analysis was commonly used to label, organize, and interpret themes across a data set (Braun, et al., 2014; Nowell, et al., 2017; Vaismoradi, et al., 2016). Thematic analysis allowed a researcher to identify common themes and experiences, which was appropriate for case study research (Yin, 2018). In an attempt to make sense of all elements of the gathered data, thematic analysis often yields the answers to the research questions (Braun & Clarke, 2014; Nowell et al., 2017; Vaismoradi et al., 2016). There are six phases of thematic analysis: (a) familiarize yourself with the data, (b) generate initial codes, (c) search for themes, (d) review the potential themes, (e) define and code the themes, and (f) produce a report (Braun & Clarke, 2014; Nowell et al., 2017; Vaismoradi et al., 2016). Thematic coding came from both semistructured interviews and observations. These codes were created and organized within an Excel spreadsheet. The Excel spreadsheet was utilized to facilitate triangulation of the multiple types of data.

I used coding in theme generation together with the data analysis software called NVivo. Yin (2018) stated that software programs can reorganize the analysis process, allowing the identification of patterns and themes from the generated data. Also, qualitative analysis software helped generate spreadsheets, codes, themes, facilitating visual displays of the data (Lune & Berg, 2016). After NVivo generates themes, I compared these themes to the past research and analyzed them on their alignment with the conceptual framework, ISSM. With regards past research, I compared and contrasted themes found in this study with the themes discussed in the literature review.

Specifically, I specified whether the findings of the study agree with, disagree with, or provide new information in relation to the research discussed in the literature review.

## Reliability and Validity

### Dependability

Dependability was the consistent nature of the analytical procedures (Noble & Smith, 2015). This included factors of personal research bias or other factors that may have altered the findings (Noble & Smith, 2015). Dependability enabled other scholars to replicate the process of the research project (Leung, 2015). I took multiple steps to ensure dependability. I listed and account for any biases. Also, there was be in-depth recordkeeping to show a clear data trail. Triangulation was utilized to show a streamlined thought process throughout the data analysis and interpretation phase (Leung, 2015). To ensure dependability, experts reviewed and verified the instruments data collection process; member checking ensured and supported that participants were content with their answers, and data saturation ensured dependability.

### Credibility

Credibility referred to the process in which data gathering and analysis procedures have been applied to ensure that no data was excluded (Bengtsson, 2016). To ensure credibility, I used awareness and insight throughout the research process (Stewart et al., 2017). Credibility also referred to the trustworthiness of the findings, which seeks authenticity than absolutes (Stewart et al., 2017). I also ensured credibility by using techniques such as saturation, member checking, observations, and an audit trail (Stewart et al., 2017). Credibility could be maintained by utilizing saturation and member

checking (Eisner, 2017). I reflected data saturation in the sample size. Data saturation

was the point at which no new meaningful information or major themes occurred with the

introduction of new participants (Guest, Bunce, & Johnson, 2006).

**Confirmability**

Confirmability referred to the process in which generated themes could be

confirmed within the participants' views and feelings (Connelly, 2016). Confirmability

underscores neutrality, as the researcher should not interpret the data based on previous

perceptions but based on the collected data (Korstjens & Moser, 2018). I ensured

confirmability by creating an audit trail (Chowdhury, 2015; Korstjens & Moser, 2018).

According to research, an audit trail enabled researchers or readers to openly view the

decisions made throughout the research process (Chowdhurry, 2015; Korstjens & Moser,

2018). Consequently, I utilized an audit trail, triangulation, and member checking to

ensure confirmability for this study.

**Transferability**

Transferability referred to the process in which findings can be generalized or

used by other researchers (Connelly, 2016; Noble & Smith, 2015). To ensure

transferability, I used interview protocol, observation protocol, and data saturation. This

ensured that the data was valid and transferable.

To ensure sufficient gathered data, I collected data until data saturation was

reached; that was, when no more useful data was gathered upon the addition of a new

participant (Fusch & Ness, 2015; Saunders, Sim, & Kingstone, 2018). There were a

number of methods to reach data saturation, one of the common methods was through

triangulation and member checking during the interviews (Fusch & Ness, 2015; Saunders et al., 2018). I used a saturation grid where gathered information derived from the participants' responses during the interviews were listed on a vertical line, then the interviews to be conducted on a horizontal one. I also included a second party to review the coding; this ensured that data saturation had been reached. Once data saturation was reached, I stopped the interviews, as the necessary information for saturation had been reached (Fusch & Ness, 2015; Saunders et al., 2018). For this study, data saturation occurred at the maximum amount of five participants to ensure a wide scope of knowledge.

## Transition and Summary

In Section 2, I outlined information about the role of the researcher, participants, and the selection process. The methodology and research design were verified based on existing literature. The data collection instrument and the process of data collection were also discussed, which included how the data will be stored and analyzed. There was an overview and discussions on how the interview questions were developed; and that the research adhered to ethical standards. Finally, the validity and reliability of the data collection and analysis were discussed in this section of the study.

In Section 3, I will present the findings of the study. I will deliver an application to professional practice by offering a comprehensive discussion on the applicability of the findings. In addition, I will discuss implications for social change, recommendations for action and further research. I will categorize themes and provide analysis of the findings. To conclude, I will provide a reflection of my experiences and a conclusion statement.

Section 3: Application to Professional Practice and Implications for Change

**Introduction**

The purpose of this qualitative multiple case study was to explore strategies that primary care physicians use to apply EHRs to improve patient care and increase profitability. The participants gave comprehensive responses to eight semistructured interview questions (Appendix C). I explored the data from the interviews and identified core emergent themes. The findings of the study focused on four themes: (a) end-user training, (b) meaningful use, (c) EHR acceptance, and (d) communication.

**Presentation of the Findings**

The overarching research question for this multiple case study was: What EHR documentation strategies do physicians in the healthcare industry use to improve the quality of interactions with their patients and to improve profitability? I conducted semistructured interviews to collect data from five primary care physicians from two healthcare organizations located on the central coast of California. The exploration of the data aided me in ascertaining four key themes: (a) end-user training, (b) meaningful use, (c) EHR acceptance, and (d) communication. The four emergent themes from the data analysis align with strategies for applying EHRs to improve patient care and increase profitability. Furthermore, the ISSM theory helped me explore the information systems field while focusing on EHR strategies (DeLone et al., 2002). I selected the ISSM theory as the conceptual framework to understand the study and research question.

I selected the ISSM theory as the conceptual framework to identify EHR strategies primary care physicians use to improve patient care and increase profitability.

Table 2 consists of a list of the participants' years of EHR experience and the number of

EHR applications they have used. I reviewed the two hospitals' EHR user manual guides

and policies to verify and triangulate interview data. I transcribed the interviews and

imported the data collected into NVivo 12 for coding and analysis.

**Table 2**

*Participants' Years of EHR Experience, Applications Used, and Gender*

| Participants | Years of EHR experience | Number of EHRs used | Gender |
|---|---|---|---|
| P1 | 4 | 1 | Male |
| P2 | 5 | 2 | Male |
| P3 | 4 | 3 | Female |
| P4 | 14 | 5 | Male |
| P5 | 10 | 3 | Female |

**Theme 1: End-User Training**

Training is one of the most important factors of any healthcare organization to

succeed in EHR implementation. All five participants stated that training was a crucial

part of EHR implementation that made the learning process less daunting. According to

DiAngi et al. (2019), effective EHR training may improve an end user's EHR experience.

P2 stated,

> Any new EHR (or large system change) has a learning curve that takes time and
>
> temporarily slows office productivity and efficiency. Getting office staff (MAs,
>
> back office staff) up to date and capturing all the patient data took some time. But,
>
> with effective training, some patience, and encouraging people to see the long-
>
> term benefits over the short-term pains of the learning curve of a new EMR made
>
> things a lot easier.

P3 stated,

> New providers need a significant amount of education on appropriate use.
> Moreover, many providers have learned individual tricks during training that
> make their use more powerful and efficient, and these are not broadly shared. You
> can go years thinking you need to fill out some form that no one ever looks at, or
> not realizing there is a useful dot phrase (autotext) or a better way of doing
> something of which you were not aware. That is why training is so important.

P5 stated, "I had a specialty based training, which was great. It was focused on how my specialty used the EHR system. The trainer designed the training sessions that best suited my specialty's needs."

Nuamah et al. (2020) indicated that simulation-based training may be used to improve EHR use, thus improving healthcare providers' skills and attitudes. P4 stated there are several different EHR training strategies. The strategies are (a) classroom training, (b) one-on-one training, (c) specialty-based training, and (d) process-based training. P4 stated one-on-one training and specialty-based training were the most effective.

> P2 stated
>
> Hiring a training consultation group definitely helped us out a ton. The trainers
> were excellent with training our staff on the new EHR as well as mapping out our
> new workflows. Our staff are now proficient within the EHR and this has cut time
> down. Profitability for our practice comes down to how many patients we see a
> day. The shorter amount we spend charting or getting lost in the EHR, gives us

more time to have to see more patients. Also, we get compensated much more and

quickly because of our new documentation within our EHR, we have it meeting

guidelines that both Medicare and insurance companies are looking for. We are

now less likely to miss out on profits (CPT& ICD codes).

Table 3 shows subthemes that emerged from the data analysis regarding end user

training.

**Table 3**

*Theme 1: End-User Training Coding Occurrence*

| Word | Frequency |
| --- | --- |
| Training | 20 |
| EHR | 15 |
| Payments | 12 |

The end-user training theme can be tied to existing literature on effective business

practice. Data collected have shown that effective end-user training must be done

correctly to implement an EHR application successfully. With EHR systems in the

healthcare industry swiftly spreading, the benefits of developing poised providers through

efficient training are becoming more apparent (Simpson et al., 2020). P1 stated,

The biggest challenges were provider training and efficiency. Change is hard for

everyone, and physicians who have practiced in a certain manner for many years

oftentimes have a difficult time when that workflow is disrupted. However, with

the proper EHR training that can be fixed.

In addition, physicians have noticed major improvements in their workflow after successful EHR training (Diangi et al., 2019). Ninety percent of the participants stated effective end-user training decreased their workload and improved EHR usability. Consequently, I concluded that the literature review and participants' answers have confirmed that to implement an EHR application successfully, primary care physicians and healthcare organizations must apply an effective end-user training program. Primary care physicians and healthcare organizations may apply the following strategies to implement EHR applications successfully: (a) promote role-based and one-on-one training, (b) hire a knowledgeable physician engagement specialist, (c) develop a clinical informatics team, and (d) provide 24/7 EHR support.

The end-user training theme ties to the service quality dimension of the ISSM conceptual framework because primary care physicians and other clinicians obtain staff training and technical support strategies to ensure service quality. The service quality dimension is used to assess the technical support, user training, network infrastructure, and reliability of the system in place for end users of healthcare organizations (Ojo, 2017). End-user training is provided by a clinical informaticist. The clinical informaticist is both technical and clinical. Thus, the service quality of the ISSM conceptual framework confirms the importance and benefits of effective end-user training.

**Theme 2: Meaningful Use**

Meaningful use is a program created by the U.S. federal government to encourage eligible medical professionals with compensations to use a compliant and certified EHR application (Alammari et al., 2021). P1 stated, "The purpose of meaningful use is to

improve healthcare for patients by making it safer and more effective." Meaningful is

divided into three stages: (a) Stage 1, data capturing and sharing; (b) Stage 2, advanced

clinical processes, and (c) Stage 3, improved outcomes. For a provider or healthcare

facility to be eligible for the EHR incentives program, they must prove to Medicare and

Medicaid that they adopted, upgraded, and implemented a compliant and secured EHR

application (Murphy et al., 2020). According to the CDC there are five health outcomes

policy priorities providers and hospitals must abide by: (a) improving quality, safety,

efficiency, and reducing health disparities; (b) engaging patients and families in their

health; (c) improving care coordination; (d) improving population and public health; and

(e) ensuring adequate privacy and security protection for personal health information.

P2 stated,

Being compliant with new federal guidelines. Showing that our practice also has

implemented meaningful use. We want to be current with patient care and having

a robust, updated EHR system was the way to go for us. That was the reason why

we transitioned over. Also, benefits of seeing how we can potentially serve our

patients and community more, by being more efficient enough, it has free up our

schedule more, which allowed us to see, schedule, and serve more patients, which

has been beneficial for our practice. The last EHR we used, our clinicians were in

patients' charts for longer periods of time, making their visits and rounding much

longer. Now, we are more efficient and can see more patients.

P1 stated that in 2018 all healthcare providers were required to report on the

quality payment program requirements, as shown in Table 4. This table is from the

Centers for Medicare and Medicaid Services and depicts a proposed scoring methodology

for the quality payment program.

**Table 4**

*Proposed Scoring Methodology for Quality Payment Program*

| Objectives | Measures | Points |
|---|---|---|
| e-Prescribing | e-Prescribing*** | 10 points |
| | Query of PDMP | 5 points (bonus) |
| Health Information Exchange | Support Electronic Referral Loops by Sending Health Information**** | 20 points |
| | Support Electronic Referral Loops by Receiving and Incorporating Health Information**** | 20 points |
| Provider to Patient Exchange | Provide Patients Electronic Access to Their Health Information | 40 points |
| Public Health and Clinical Data Exchange | Report to two different public health agencies or clinical data registries for any of the following: Immunization Registries Reporting** Electronic Case Reporting** Public Health Registry Reporting** Clinical Data Registry Reporting** Syndromic Surveillance Reporting** | 10 points |

*Note.* Exclusions available. Source: CMS Quality Payment Program Final Rule.

Table 5 shows subthemes that arose from the data analysis regarding meaningful

use.

**Table 5**

*Theme 2: Meaningful Use Coding Occurrence*

| Word | Frequency |
|---|---|
| Benefits | 18 |
| Payment | 15 |
| Compliance | 14 |

The meaningful use theme ties to existing literature on effective business practice.

Ninety percent of the participants agreed that meaningful use has increased their

workload and burnout. Emani et al. (2017) noted that primary care physicians conveyed negative views about meaningful use in Stage 1 and Stage 2. The interviewed participants stated they were under the impression that meaningful use would improve patient care, reduce medical errors, and decrease their workload. Instead, it did the opposite. Even though EHR meaningful use has grown in popularity, providing significant administrative benefits over paper records, existing EHR meaningful use trends do not often translate into higher quality treatment in primary care physician practices and healthcare organizations (Alammari et al., 2021). These continuing deleterious views are concerning for EHR implementation. Therefore, I concluded that the literature review confirmed burnout and increased workload are challenges for primary care physicians that need to be addressed to improve patient care and increase profitability. I concluded that the literature review has confirmed primary care physicians may apply the following strategies to implement EHR applications successfully: (a) follow meaningful use guidelines, (b) promote the patient portal, and (c) promote patient privacy.

The meaningful use theme ties to the information quality of the ISSM conceptual framework because primary care physicians must pay attention to how information in the EHR system is stored, delivered, and created to obtain all the benefits that meaningful use has to offer. Primary care physicians are already working to meet Stage 2 requirements, in which they will be asked to input the correct information into the EHR and use their EHRs in more innovative ways in Stage 3 (Cohen et al., 2015). Murphy et al. (2020) posited to meet meaningful use requirements. Primary care physicians must enter their medication and laboratory orders through the EHR system and select the correct

diagnoses for their patients. Thus, the information quality of the ISSM conceptual

framework confirms meeting meaningful use requirements could help primary care

physicians implement EHRs successfully. Primary care physicians should be mindful of

the information that they enter into the EHR system because quality information

improves patient care.

**Theme 3: EHR Acceptance**

One of the greatest challenges healthcare providers face is acceptance of EHRs.

Especially for the ones who have done their documentation on paper for many years. P4

stated "EHR acceptance was one of the biggest challenges outside of financial challenges

of cost for the new EHR and implementation. Many of our staff here were used to the old

system and did not want to change. Places that I have worked at before also faced this

key challenge. As humans, we tend to be uncomfortable with change. The same goes for

professional medical personnel". Understanding the factors moving hospital EHR

adoption by users is a vital matter (Tabesh et al., 2020). P1 stated,

> In order to get the healthcare providers to embrace EHR implementation, the
>
> following must be done: Hire a physician champion, get well-trained super users,
>
> have 24/7 tech support, listen to their concerns, create an EHR committee group
>
> for providers, hire a knowledgeable consultant.

P2 stated,

> We hired a physician engagement specialist to assist us with our EHR needs. That
>
> was a huge help for us. We weren't left alone which gave us a lot of confidence.

When we had EHR related questions, the physician engagement specialist was
able to answer them.

Table 6 depicts subthemes that emerged from the data analysis regarding EHR
acceptance.

**Table 6**

*Theme 3: EHR Acceptance Coding Occurrence*

| Word | Frequency |
|------|-----------|
| Physician Champion | 8 |
| Buy in | 12 |
| Specialist | 11 |

The EHR acceptance theme ties to existing literature on effective business
practice. Gagnon et al., (2014) posited primary care physicians' acceptance of EHR
applications is a critical concern to EHR implementation. EHR acceptance by primary
care physicians demands a lot of training, time, and financial resources (Huang et al.,
2018). Additionally, perceptions towards the use of EHR can differ between primary care
physicians, which may add to the difficulty in implementing an EHR application. Primary
care physicians have to understand the factors that are influencing EHR acceptance to
implement EHR applications successfully. Therefore, I concluded that the literature
review has confirmed primary care physicians may apply the following strategies to
implement EHR applications efficiently: (a) Provide effective EHR training, (b) Provide

technical support, (c) Hire a physician champion, and (d) Hire a knowledgeable

consultant.

The EHR acceptance theme ties to user satisfaction of the ISSM conceptual

framework. User satisfaction measures how satisfied an end- user is with an EHR

application. Fristina et al., (2017) posited EHR systems with poor designs considerably

increase the workload of providers while caring for their patients consequently reducing

user satisfaction, intensifying frustration, and causing unproductive workarounds. Poorly

designed EHR systems can adversely affect patient safety and frustrate providers.

Therefore, an end-user must be satisfied with the EHR application to accept it.

**Theme 4: Communication**

Communication is vital when implementing an EHR application. Effective EHR

communication has the potential to ease patient-physician communication via messaging.

Messaging can also facilitate patient access to non-public records, look at laboratory and

radiology results, health education tools, and tools for pursuit and evaluating chronic

disease management progress (Vos et al., 2020). P2 stated, "The most important is

interactions with your patients. It's not so much that it's an interaction with them as your

message what you're communicating because this is supposed to be a communication

tool, first and foremost, is being communicated to other doctors, and then communicating

to me so for me to find out what's going on with someone. It's advantageous if I have a

good note to read on from a patient if you have a good note that should also help with the

documentation for the coding and such, but you can't have one without the other if you're

doing it for coding, and it's just a list of like ICD 10 codes with words". Table 7 shows

subthemes that emerged from the data analysis regarding EHR communication.

**Table 7**

*Theme 4: Communication Coding Occurrence*

| Word | Frequency |
|------|-----------|
| Interactions | 8 |
| Challenges | 17 |
| Documentation | 15 |

The communication theme ties to existing literature on effective business practice.

Effective communication is eminent to implement an EHR application successfully.

Woody (2020) sated lack of effective communication can hinder an EHR

implementation.most technology failures result from a lack of effective communication

because it fails to involve the individuals who will be affected in the introduction of a

new technology, resulting into barriers too large for them to overcome later on. One of

the participants stated "it is imperative that a clinician is involved during the design and

implementation process of an EHR. Keeping a line of communication between clinicians

and IT staff is a must." The inability to communicate properly can quickly and easily

derail any EHR implementation. Therefore, I concluded that the literature review has

confirmed primary care physicians may apply the following strategies to implement EHR

applications successfully: (a) apply effective communication, (b) conduct weekly

meetings, and (c) ensuring IT staff and clinicians are on the same page.

The communication theme ties to the net system benefits of the ISSM conceptual framework. The net system benefits refer the overall value of the system to its users and organizations (DeLone & McLean, 2002). Effective communication is one of the net system benefits in EHR implementation. Effective communication is needed in every facet of an EHR implementation. White (2013) posited providing patient-centered care relies greatly on communication between patient and physician.

## Applications to Business Practice

The concentration of primary care physicians' use of training, meaningful use, EHR acceptance, and communication to utilize an EHR application applies to business practices. Primary care physicians may apply the results of the study to improve patient care and increase profitability. Most of the participants asserted that to implement an EHR application successfully, and primary care physicians may apply the following strategies: (a) obtain proper training (b) encourage EHR acceptance (c) follow meaningful use guidelines properly (d) apply effective communication. Having a secure and well-built EHR application may improve patient care and increase profitability for primary care physicians and healthcare organizations (Vos et al., 2020). I conducted the study on the central coast of California, but the results may be relevant to other regions. The acknowledged themes may offer supplementary knowledge into the hurdles for implementing EHR application into the healthcare field. Correctly implemented, EHR applications can improve workflow, fewer medical errors, higher profitability, and enhanced patient care (Everson et al., 2020). The findings are relevant to improved business practices because it comprises documented strategies for applying EHRs to

improve patient care and increase profitability. The findings may help primary care

physicians and healthcare organizations that are struggling to improve patient care and

increase profitability.

## Implications for Social Change

One-way primary care physicians could positively impact society is by being

educated on the accessible strategies to use a medical records system and improve patient

care and profitability. This study's results may have significant consequences for

enhancing physician-patient relationships through enhanced quality of healthcare for

patients, families, and communities. The use of EHRs can revolutionize how medical

information is stored, communicated, and processed by healthcare providers. Adopting

EHRs may lead to improvements in patient safety, quality of care, efficiency, and

reduced cost for patients (Blijleven et al., 2017).

## Recommendations for Action

The following recommendations developed from my research as well as the

research in the academic literature. These recommendations are particularly pertinent to

primary care physicians and hospitals that are involved with adopting EHR applications.

Primary care physicians and hospitals may find these recommendations helpful. Four

themes emerged as a result of this study: (a) end-users training, (b) meaningful use, (c)

EHR acceptance (d) Communication.

Primary care physicians and hospitals should consider the following:

- Conduct training based on the physician's specialty

- Create a strong support team to assist the end-users with their needs and concerns

- Have a well-trained physician champion who can promote EHR acceptance

- Execute a mock go – live before going live with the EHR application to ensure that everything in the EHR application is running accordingly

- Create a governance team to assist with changes in the EHR system

- Maintain a line of communication with the EHR vendor

- Provide tip sheets and tricks to assist with workflow maintenance

- Secure patient information with encryption and change password every 3 months to protect patient information

- Keep up with meaningful use guidelines

These recommendations could be disseminated through training manuals, tip sheets, or by speaking at weekly conferences focused on EHR implementation. The dissemination of the study results could aid primary care physicians and healthcare organizations in implementing EHR applications efficiently.

**Recommendations for Further Research**

The emphasis of this qualitative study was the strategies primary care physicians can use to apply EHR to improve patient care and increase profitability. Scholars may use the identified themes to lead research studies. The following recommendations for further research are: (a) strategies primary care physicians can use to implement meaningful use (b) strategies physician champions can use to promote EHR acceptance, (c) strategies hospitals can use to prevent EHR security breaches, (d) strategies clinics can utilize to implement a secured EHR application, (e) strategies for applying EHR to improve patient satisfaction scores.

The limitations depicted in this study were the sample size might not be suitable to draw conclusions and only one geographical region was used. Some scholars may use more than one state and utilize a larger sample size to not constrain the generalizability of these results. Further research may aid to analyze and assess the views of different group of physicians involved in EHR implementation.

## Reflections

The purpose of this qualitative multiple case study was to explore strategies for applying EHRs to improve patient care and increase profitability. I chose this research topic because I find it to be fascinating and innovative. I work as a clinical informaticist, and I have wide-ranging experience with EHRs applications. Since I was familiar with the research topic, I had some assumptions regarding strategies primary care physicians can use to improve patient care and increase profitability. To mitigate these biases, I applied self-reflexivity.

I did have some challenges during the recruitment process for the interviews. Two of the participants did not reply to my email promptly and did not show up for the interview. I had to reschedule the interview. Fortuitously, the participants showed up the second time I invited them. By and large, the participants stated that it was a fun experience, and other primary care physicians, healthcare organizations could use this study as a reference to implement EHR applications successfully. The doctoral study process was a fantastic learning experience. I enjoyed the interview process, and I learned a lot about the research topic.

## Conclusion

Primary care physicians who need assistance with applying EHRs to improve patient care and increase profitability may find this helpful study. This qualitative multiple case study's findings may help primary care physicians and other healthcare organizations improve patient care and increase profitability. I specified some recommendations of action in this study. Four themes emerged from the analysis of the data gathered throughout this study. The four themes detected were (a) end-user training, (b) meaningful use, (c) ehr acceptance, (d) communication. Through the information acquired from this study, business leaders may develop a more profound comprehension of how to address the potential roadblocks that primary care physicians face while improving the nature of communications with their patients through utilizing EHRs applications. The results of this exploration could offer exceptional subjective help to improve business practices through EHR frameworks for improving the quality of the interactions between primary care physicians and their patients. Furthermore, the study results can help enhance physician-patient relationships' quality by enabling improved quality of healthcare and benefiting patients, patient's families, and communities.

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Appendix A: Doctoral Student Project Information Sheet

Implied Consent Process

Fritzgerald Paul, Clinical Informaticist PES, with the EHR Alliance and located at

Marian Regional Medical Center, is a doctoral student at Walden University. The

doctoral student is conducting a qualitative multiple case study to explore electronic

health records documentation strategies used by primary care physicians in the healthcare

industry to improve the quality of patient interactions and increase profitability. The

doctoral student is inviting you to take part in this project because you are a physician

with experience using the EHR to improve patient care and increase profitability.

Participating in this project is completely voluntary and optional. If you agree to

participate you will be asked to attend an in-person or phone interview with the doctoral

student to answer questions about your experience using EHR strategies to improve the

quality of interactions with your patients and increase profitability. By attending the

interview you give your consent to participate in this project.

**Background of the project:**

The purpose of this qualitative multiple case study is to explore electronic health records

documentation strategies primary care physicians use in the healthcare industry to

improve the quality of interactions with their patients and to increase profitability.

**Instructions:**

If you agree to be part of this doctoral student's project, you will be asked to:

- Allow the doctoral student to record the interview.

- Be interviewed for about 35 minutes.

- Ensure that the interview takes place on a time and day that works for both the doctoral student and participants.

- Ensure the doctoral student's summary of the interview is accurate

**Interview Questions:**

What strategies did you use to ensure that you selected a suitable EHR application for your practice?

What was the desired goal for the EHR system on your practice?

Based upon your organization's experience, what were the key challenges to EHR implementation?

What strategies did you use to achieve positive implementer and user attitudes toward improving EHR documentation quality?

What strategies do you use to protect your EHRs information quality?

What EHR documentation strategies do you use to improve profitability?

What EHR documentation strategies have you found to be useful for improving profitability?

What else can you share with me about the EHR documentation strategies you use to improve the quality of interactions with your patients and increase profitability?

**Payment:**

There will be no compensation given to the project participants. All participants will receive a copy of the quality improvement findings at the conclusion of the doctoral student project.

**Privacy:**

Any information provided by the participants will remain private and confidential. The doctoral student will protect the participants' personal information and will not include the participant's name in project records. The interview will be recorded and transcribed with the physician's permission. The data collected will be kept in a safe place and will only be accessible by the doctoral student for the purposes of this quality improvement project only.

**Questions:**

The Participants may ask any questions at any time during and after the interview session. Participants may also end the interview or decline to answer any questions at any time during the interview. If you have any questions about this project please contact Fritzgerald Paul at xxxxxxxxxx or a Dignity Health representative at xxxxxxxxxx.

**Statement of consent:**

I have read the above information sheet and I understand the project scope and that my decision to participate in the interviews with the doctoral student for this project is completely voluntary. By signing this information sheet, I agree to participate in the interview session described above and will receive a copy of this signed form for my records.

Printed name of participant _____
Date signed _____
Participant's signature _____
Doctoral student's signature _____
Data signed _____

Appendix B: Interview Protocol

Date of Interview:

Institution: Marian Regional Medical Center (Dignity Health facility)

Interviewer: Fritzgerald Paul

Assigned Participant ID number:

Instructions

1. Welcome the participant

2. Inform the participant the purpose of the project

3. Remind participant of confidentiality and assign participant a number

4. Ensure information sheet is signed to acknowledge agreement to participate in the doctoral student project and interview session.

5. Remind the participant that the interview will be recorded and reconfirm agreement to be recorded and participate in the interview.

6. To ensure participant privacy, remind the participant to not state anything during the interview, such as their name, that would personally identify them in the interview recording.

7. Start interview recording

8. Ask the participants open-ended semistructured interview questions (see Appendix C)

9. When conducting a face-to-face interview, I will watch for non-verbal cues such as eye contact, facial expressions, and tone of voice.

10. When conducting a telephone interview, I will listen for changes in tone of voice.

11. Summarize statements as needed

12. Show gratitude to the participants and remind participants that they will have the opportunity to review the transcripts of the interview for accuracy. Provide email address and telephone number: 617-xxx-xxxx.

13. Schedule follow-up for member checking

Appendix C: Interview Questions

1. What strategies did you use to ensure that you selected a suitable EHR application for your practice?

2. What was the desired goal for the EHR system on your practice?

3. Based upon your organization's experience, what were the key challenges to EHR implementation?

4. What strategies did you use to achieve positive implementer and user attitudes toward improving EHR documentation quality?

5. What strategies do you use to protect your EHRs information quality?

6. What EHR documentation strategies do you use to improve profitability?

7. What EHR documentation strategies have you found to be useful for improving profitability?

8. What else can you share with me about the EHR documentation strategies you use to improve the quality of interactions with your patients and increase profitability?

Appendix D: Letter of Invitation to Participants

You are invited to take part in research on strategies for applying electronic health records to improve patient care and increase profitability. The purpose of this qualitative multiple case study is to explore electronic health records documentation strategies primary care physicians use in the healthcare industry to improve the quality of interactions with their patients and to increase profitability. The results of the study may help to determine the strategies that primary care physicians in hospitals can use to apply EHR to improve patient care and increase profitability.

The researcher is inviting primary care physicians involved with EHR systems implementation to be interviewed. All participants will receive a copy of the research findings. This study is being conducted by a researcher named Fritzgerald Paul, who is a doctoral student at Walden University. Fritzgerald Paul can be reached at XXXXXX or phone XXX-XXX-XXXX.