

## **INTRODUCTION**

The movement to a technology-oriented world in healthcare has proven necessary over the past few decades. There is no better indicator of the need for more efficient ways to share healthcare information and policies than the recent outbreaks, such as SARS-CoV, MERS-CoV, and the 2020 COVID-19 pandemic. To provide global healthcare to the citizens of the world, hospitals and other healthcare facilities are implementing electronic healthcare record (EHR) systems. These systems improve quality of care, lower administrative costs, and reduce medical errors. The implementation of EHR systems require a great deal of involvement by members within the healthcare ecosystem. The norms, values, and behaviors of the healthcare ecosystem play an important role in the implementation and post-adoption of EHR systems (Fennelly, et al. 2020, Meeuwesen, van den Brink-Muinen et al. 2009). Understanding the differences among national cultures may contribute positively to improving cross-national implementation of current EHR systems.

Culture is defined as the “collective programming of the mind distinguishing the members of one group or category of people from others” (Hofstede 1994, p. 4). This form of collective programming differs between societies and therefore makes it impossible to study different society healthcare systems in isolation of their cultural and social aspects (Schouten and Meeuwesen 2006, Meeuwesen, van den Brink-Muinen et al. 2009). The recent impact of the COVID-19 pandemic draws deeply on countries cultural characteristics in the implementation and transformation of several measures and processes required to fight off the momentum of the various outbreaks. As we saw various countries highlight their concerns and demonstrate their actions to slowdown outbreaks, it became very clear that “the cultural characteristics of each society prevent these measures from being applied in the same way globally” (Gokmen et. al, 2021). Thus, the improvement of communication, cooperation, and integration of healthcare policies across societies will highlight the antecedents important to the successful post-implementation of EHRs on a global scale.

## **EHR Implementation: The Influence of a Pandemic on National Culture**

The need to supply EHRs beyond the boundaries of one country is a continuous uphill battle of successful implementation. EHR implementation stories around the world look different, yet the technologies deployed are often designed by people from dominant national cultures where these powerful nuances are incorporated and embedded into the software. The way technology is diffused is greatly affected by the impact of cultural mores and conventions on not only those who develop, but also those who adopt. Therefore, the influence of national culture may appear subtle however has powerful impacts on people and systems. This paper will explore how cultural characteristics among individual countries, during a pandemic or in the post endemic era, interrelate with various EHR implementations influenced through the cultural characteristics of the EHR vendor. Furthermore, we will investigate various change requests and inquiries that vendors (such as Epic, Cerner, McKesson, etc.) received during EHR use in the pandemic, the cultural characteristics which defined differences on countries ability to address needs during the pandemic, and the inabilities of the EHR during the pandemic based on the user's interactions. The results of the proposed study improve understanding of the significance of national culture with respect to successful IS implementation and usage. It will enable practitioners to enact organizational changes that account for cultural differences in implementation projects across multiple locations to improve the results of deploying IS across cultural boundaries.

### **THEORETICAL FOUNDATION**

National culture is an essential part to the understanding of how to successfully implement EHRs across countries and explain why implementation vary greatly across countries in their success rate. The investigation of culture on general assumptions, values, and/or behavior patterns is more applicable at a national group level among the healthcare industry. Specifically, healthcare crosses boundaries not only at the organizational level but across cities, states, and countries and therefore is no longer just about the values, norms, and behaviors of employees but members including healthcare representatives, patients, vendors, etc.

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Although several individuals have conceptualized national culture (e.g., Hall and Hall 1990, Trompenaars 1996, Hofstede 2010), Hofstede's dimensions address issues which are better aligned with information systems implementation (Myers and Tan 2003) and contain published numerical data sets across 93 countries. Hofstede's taxonomy describes national culture across several dimensions: power distance, individualism, masculinity, uncertainty avoidance, pragmatic (also known as long-term orientation), and indulgence (Hofstede 2001, 2010).

Power Distance addresses the inequalities among people and refers to the range in which the less powerful members of a society expect and accept that power is distributed unequally. Individualism is a social framework where members are expected to take of themselves and immediate family members only. On the opposing scale, collectivism describes a society that looks out for one another in exchange for unquestioning loyalty. This dimension indicates if a society's member envisions themselves as "I" or "we". Masculinity versus femininity refers to a society where gender roles are clearly defined. Masculinity is represented as tough, assertive, successful, and competitive, whereas femininity represents caring, tender, modest, and concern for quality of life. Uncertainty avoidance refers to the likelihood a group feels comfortable in controlling the future, i.e., the extent to which members of the organization/institution feel uncomfortable with uncertainty and ambiguity. Initially referred to as long term versus short term orientation, in the business community known as pragmatic versus normative, this dimension focuses on the ties to the history of the society and its influence on the challenges with the present/future. Societies that score low are more traditional, fulfill social obligations and view change as suspicious, whereas a high score lends to a pragmatic approach – thrift, adaptation, and perseverance. Finally, the most recent dimension discovered, indulgence versus restraint, refers to the level of gratification. Indulgence promotes the enjoyment of life and having fun and restraint suppresses these needs and follows a set of strict social norms.

## **DATA AND METHODS**

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In an initial review of Hofstede's dimensions in conjunction with a few major countries, we conducted a quick pilot based on countries where we collected data on their experiences with EHR implementation. Hofstede collected data on over 93 countries via surveys address the six dimensions on continuums between 0 and 100, which describe societies and not individuals.

	UK	US	Germany	Ireland
<b>Power Distance</b>	35	40	35	28
<b>Individualism</b>	89	91	67	70
<b>Masculinity</b>	66	62	66	68
<b>Uncertainty Avoidance</b>	35	46	65	35
<b>Pragmatism</b>	51	26	83	24
<b>Indulgence</b>	69	68	40	65

Figure Table 1. Comparison of National Culture Scores across Hofstede's Dimensions

\*Scores from <http://geert-hofstede.com>

Reviewing the numbers in Figure 1, there are cultural significant differences in the four countries across individualism, uncertainty avoidance, pragmatism, and indulgence. In a similar fashion, Gokmon et al 2021, found that during a pandemic significance was found across individualism and indulgence. Unfortunately, their research did not show significance for uncertainty avoidance or pragmatism, however it did show significance for power distance.

Interestingly, they proposed that countries high in uncertainty avoidance are more efficient in implementing COVID\_19 measures, due to their hesitancy to immediately react which allows these countries to engage in trusted, orthodox behaviors. We note in our pilot study that doctor's task-orientation and preference for technological solutions (Meeuwesen, van den Brink-Muinen et al. 2009) are two healthcare examples where uncertainty avoidance of the national culture may influence the successful progression of EHR implementation and post-adoption. Countries who score high are less likely to value the importance of the technological solutions which the EHR and its extended tools may provide. A low score will impel countries to go forward with little hesitation on an electronic healthcare endeavor and look to the future with positivity and strength, however lack the security and safety measures of a "wait and see" method. Therefore, a nation's level of uncertainty avoidance will differ in a

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pandemic period compared to a natural non-pandemic state. Time and panic are definitely major factors to consider within uncertainty avoidance.

In the healthcare industry, pragmatism has relevance in assisting with preventative care and symptom orientation (Meeuwesen, van den Brink-Muinen et al. 2009). The change for hospitals to an electronic healthcare system is drastic and is not met well with normative, or low scoring countries where the change and adaptation requires long-term investigation. The requirements of the US policies (e.g., Health Insurance Portability and Accountability Act of 1996 (HIPAA), the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009, and the Patient Protection and Affordable Care Act of 2010 (PPACA)) to require the healthcare industry to exchange information electronically changes the national culture dynamics of the low scoring seen in Hofstede's analysis. In the pilot, analysis of Germany's pragmatic style is supported among the university and private hospitals which continue to drive for change and fostering of future rewards. Interestingly, pilot findings show that although the UK are being prudent in progressing to an electronic healthcare system they are maintaining a traditional, normative stance that provides additional time to watch how adoption and implementations progress in other countries. Therefore, nations who score low in pragmatism are less likely to implement EHRs efficiently in a pandemic or endemic era due to the fast-paced nature and need for quick adaptation.

Due to space limitations here, we will highlight quickly that further investigation of power distance, masculinity, uncertainty avoidance, and pragmatism will highlight some of the cultural characteristics (from the developer) that may have underlying power and nuances which contrast with the implementing country.

## **CONCLUSION**

In this paper, we hope to achieve a better understanding of how national culture and the development of EHRs incorporating their developer's cultural characteristics interact during a pandemic or in the post endemic era. Particularly, the impact contradicting characteristics may have in assisting to reduce outbreaks. To address this, we will evaluate the cultural characteristics defining countries and their

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relationship to the needs of managing healthcare concerns, review the various changes and inquiries that vendors received, and finally develop a series of global characteristics versus cultural characteristics of healthcare information technology to improve successful implementation of EHRs. In an initial pilot focused only on how national cultural differences among healthcare facilities, in four countries (Germany, Ireland, United Kingdom, and the United States), influenced the success of clinical enterprise system implementation, we discovered that the differences among societies do influence the long-term success of implementation of EHRs. Organizations that have extremely low scores on pragmatism may get lost in the drudgery of steep tradition and the hold of other enterprise systems traditional mechanisms could prevent the thrift and quick foresight required of the very different challenges healthcare systems produce. We furthermore discovered a number of characteristics in the investigation of the six dimensions that may play a role in the implementation of EHRs, which may change and even provide deeper explanation for the different outcomes when the same measures/processes are implemented across different countries during a pandemic. We look forward to exploring more the interaction of national culture, cultural characteristics embedded within technologies, and global impact of a pandemic.

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