

An Exploratory Analysis of the Role of National Culture in the Transfer of Information Technology to the Arab World



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Summary:

This research explores the relationship between the National Culture and Information Technology Transfer (henceforth, ITT) within the context of the Arab World. A crucial question regarding ITT is the extent to which national culture influences IT transfer to Arab nations. To answer such a puzzling question, this study analyses related literature highlights numerous viewpoints from different perspectives on this topic, and provides various empirical studies in the field. This paper showed the knit and intricate linkage between Cultural Factors and Information Technology Transfer to the Arab world that may support or impede a successful technology transfer. This critical review is intended to serve as a guiding framework for a more comprehensive understanding of the significant role that national culture plays in the success of ITT, particularly in the Arab world.

Keywords: Arab Countries; Hofstede's Cultural Dimensions; Information System; Information Technology Transfer (ITT); National Culture

1. INTRODUCTION

The growing significance of Information Technology Transfer (ITT for short) arises from the potential benefits that accrue to all countries when IT transfer projects are carried out efficiently. More precisely, Al-Mabrouk & Soar (2008) point out that ITT poses a substantial challenge for developing countries. IT transfer is extremely hazardous, time consuming, and high priced because of the complicated processes involved in it. The corpus of currently available research indicates that few efforts have been made to comprehend the impact of "National Culture" on the process of IT transfer to Arab world countries. Hence, IT transfer strives to bridge the gap between industrialized and developing nations while fostering economic growth,

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global competitiveness, equitable distribution of products and services, as well as access to international markets (Al-Mabrouk & Soar, 2006).

A substantial amount of published research on the uptake of Information Systems (IS) has been carried out in the environment of the world's advanced economies, mainly in countries in the West such as Europe and North America (Alhashemi & Weistroffer, 2017). Unfortunately, relatively very little research has been conducted on the role of cultural factors in the intricate landscape of Information Technology Transfer within the Arab world (Al-Mabrouk & Soar, 2008, 2009; Hill et al., 2008; Straub et al., 2003)

However, the advancement of Information Systems (IS) is no longer limited to a few regions around the world. They are produced in countries with widely different business environments and cultures. As a result, culture is regarded as a significant variable in the development process, which is capable of introducing its own set of challenges, and consequences which can range from project failure to delayed delivery of operational systems (Shore & Venkatachalam, 1996). Yet, the influence of culture may be indirect, hard to distinguish, and difficult for measurement. Perhaps for these reasons, there have not been many theoretical or empirical research studies that explicitly examine the impact of national culture on the process of IT transfer to Arab countries.

The effectiveness of the IT transfer process hinges not only on economic, political, , social issues, as well as technological environments, but also on the Cultural Issues (Al-Mabrouk & Soar, 2006). These cultural factors have a significant impact on whether IT transfer to the developing countries in general and the Arab world in particular succeeds or fails. Yet, the existing literature reveals a dearth of research in this area, with a lack to comprehend the influence of national culture in IT transfer process in Arab countries. Consequently, this paper is an attempt to fill that gap in the Arab World literature. We seek to explore, analyze, and engage in discourse regarding the pivotal role of "national culture" in facilitating successful Information Technology Transfer. Specifically, we aim to enhance and optimize the IT transfer process within the Arab countries by posing the following central research question: What are the mechanisms underlying the interplay between the Prevasive (National) Culture and Information Technology Transfer to the Arab world? Consequently, this overarching question devolves into two ensuing questions that need to be investigated, as follows: (1) How does culture impact Information Technology Acceptance ? and (2) What relationship exists between Culture and Information Technology Acceptance? The expectation is that a more thorough understanding of the cultural impact on ITT will create opportunities for improvements that may boost the likelihood of successful technology implementation. Therefore , the intent of this research is to examine the integral role of Culture in the Transfer of Information Technology to Arab Countries.

An essential area of study on global information management investigates the impact of national culture on the development of Information Technology (IT), operations, management, and use (Markus & Soh, 2003). This research paper aims to explore the influence of "national culture" in the Process of Transferring Information Technology to the Arab World.

2. Definitions of Key Terms

2.1 National Culture

Regarding the focus of this paper on National Culture and IT, it is important to first introduce the concept of culture and, more specifically, to identify the various ways in which this construct has been defined by researchers. The term culture encompasses a broad spectrum of components, involving knowledge, art, language, religion, traditions, history, customs, norms, and values. As explained by Hofstede, Hofstede and Minkov (2010, p. 6), culture is defined as "the collective mental programming that distinguishes one group or category of people apart from others". This collective programming is situated at an intermediate level, between human nature. Today, culture can be viewed as the cumulative human knowledge, beliefs, and behavior that are transmitted to succeeding generations (Faghih, 2019). So, our first point is that there is no single, universally-agreed-upon definition of Culture.

With a narrower focus on the notion of "National Culture", Nistor et al., (2014) operationally define it as "the shared patterns among people who have the same nationality or reside in the same geographical location". Accordingly, national culture is a collection of shared beliefs and values that sets one nation's individuals apart from another (El Sayed, 2018). In studying national culture, Hofstede proposed a cultural framework with four dimensions on which the differences among national cultures can be understood: Power distance, Uncertainty avoidance, Individualism-Collectivism, and Masculinity-Femininity (see Jan et al., 2022 for an in-depth analysis of Hofstede's cultural dimensions). Later on, the framework was expanded to include two additional dimensions: long-term orientation and indulgence. According to Hofstede (1991) as cited in Cabrera et al., (2008, p. 180), National culture is regarded as "one of the main factors that determine the behavior of a person in the workplace. It is primarily based on distinctive values acquired during early childhood from the families". Therefore, national culture can be regarded as a crucial factor when it comes to the process of transferring technology between countries, designing systems with culturally diverse teams or deploying systems for users from different cultural environments (Cabrera et al., 2008). Accordingly, national culture is a complex concept (Hill et al., 2008).

2.2 Information Technology Transfer (ITT)

Technology and transfer are two intricate concepts that are brought together under the term "Technology Transfer". As a result, it is important to review the

definitions and ideas that are currently used in the literature on technology transfer. According to Girven and Sangister , 1983 as cited in Al-Mabrouk & Soar (2008), the term "technology" refers to a collection of information, skills, methods, and processes used in the creation of products and services that are helpful to society. On the other hand, the notion of "transfer" in this context refers to a wide range of activities that are specifically related to developing countries. The compound term of "Technology Transfer" carries the alternate meaning of importing technology to other countries (Straub et al., 2003), and in our context to the Arab world countries. Hence, technology transfer is a process that involves the movement or flow of technical knowledge, data, designs, prototypes, materials, inventions, software, and/or trade secrets from one organization to another (Kasimin et al., 2009, p. 49). Therefore, the phrase "Information Technology Transfer (ITT)" is precisely delineated as the process by which Information Technology transitions from its producers to end-users, as expounded by (Straub et al., 2003).

As our major interest in this paper is exclusively related to the role of National Culture in the Transfer of Information Technology , the next section delves in the connection (association) between National Culture and Technology Transfer Process in relation to the existing literature from different perspectives of scholar researchers.

3. Culture and Information Technology Acceptance

As mentioned earlier in the Introduction, Information Technology Transfer (ITT) is an intricate process that sounds to be particularly challenging for developing countries. Since most technology is designed and manufactured in developed countries, it is culturally biased in favor of the social and cultural systems of those developed countries (Hill et al., 2008). Individual acceptability of IT has been a major topic of interest in information systems research. Plenty of research investigations have explored users' acceptance of IT, resulting in the development of numerous theories and models of technology adoption (Thowfeek & Jaafar, 2012). For instance, Al-Gahtani, Hubona, and Wang conducted an empirical study that tested a modified UTAUT model in a non-Western cultural environment and explained discrepancies between validations in Saudi Arabia and North America. By applying cultural dimensions theory, they hypothesized and examined the similarities and differences between the two aforementioned countries through the testing of UTAUT in terms of cultural differences that affected organizational acceptance of Information Technology. They reported that the UTAUT model explained 39.1% of the variance in intention to use and 42.1% of the variance in usage.

Culture is capable of having a significant impact on actual behavior, particularly the acceptance, and use of IT in an organization. According to Thowfeek and Jaafar (2012), a country's national culture is a critical component in constraining IT adoption. Thus, National Culture, defined as a nation's common traditions and representations, has a major influence on the design, acceptability, and use of

Information Technologies in every country. A number of researchers have started to pay much attention to the great importance of culture in technology acceptance because "a neglect of cultural differences can hinder the integration of Information Technology and escalate the likelihood of failure" (Akour et al., 2006). In this regard, Lamm (1990) as cited in (Cobb & Barker, 1992) highlights that "a country's culture has a major influence on the acceptance of technology".

4. National Culture and Information Technology Transfer

The body of the existing literature that examines national culture and technology transfer is diverse and comes from a variety of sources. Researchers from a variety of disciplines, including anthropology, sociology, economics, and business, have all contributed to our better understanding of this topic. However, the majority of the research has concentrated on organizational characteristics of the recipient organization or economic factors that affect the transfer of technology rather than the characteristics of national culture and their interplay with the transfer of technology (Hill et al., 2008). As depicted in Figure 1, culture emerges as one of the significant determinants that impact the success of Technology Transfer.

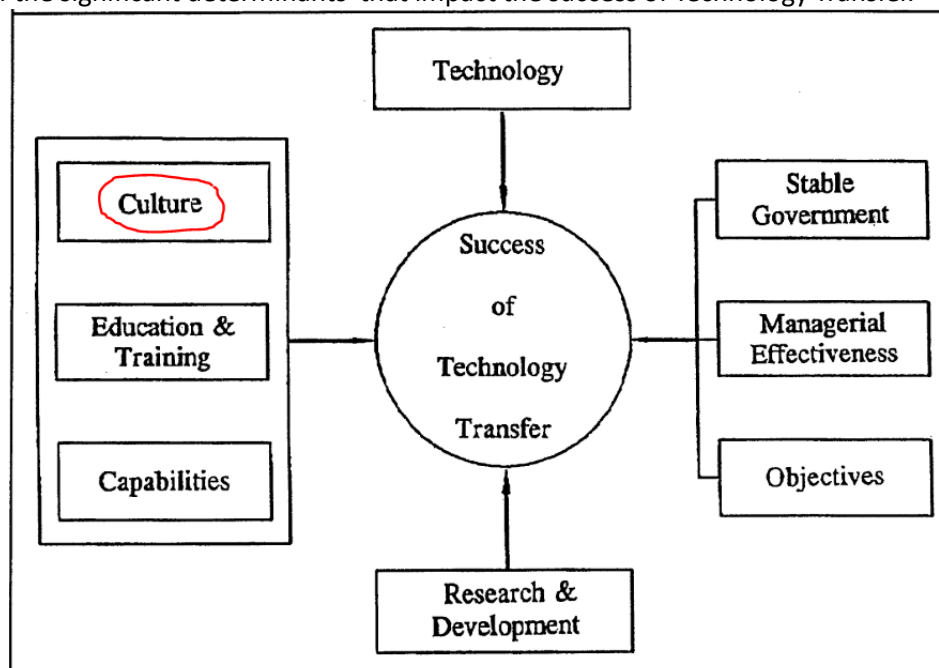


Figure 1 : Critical Factors for Successful Technology Transfer (adopted from, Cobb & Barker (1992, p. 9)

Culture shapes the particular orientation that every person assumes in their behavior in an organization and therefore may be associated with the success of Information Technology (IT) solutions transfer between cultures, as IT artefacts are not culturally neutral, as they portray values, assumptions, implications, and

consequences. Understanding the relationship between culture and IT has challenged scholars from a wide range of disciplines for nearly three decades (Gallivan & Srite, 2005). Serving as a repository of accepted norms and behavioral patterns, national culture can influence the public's online expectations, choices, and experiences, as well as its attitudes toward technology use (Zhao et al., 2014).

A growing number of researchers developed "Cultural Influence" Models and frameworks of Information Technology Transfer, with a particular emphasis on the Arab World (e.g., Cobb & Barker, 1992; Shore & Venkatachalam, 1996; Straub et al., 2003). For example, Shore and Venkatachalam (1996) developed a framework to examine the role of national culture in the transfer of Information Technology (IT) applications across diverse cultural contexts. In the Arab cultures of Egypt, Jordan, Lebanon, Saudi Arabia, and the Sudan, Straub et al., (2003) rigorously explored "A Cultural Influence Model of Information Technology Transfer" in one of the more complex cultural and social systems in the world. The research findings revealed the significant influence of Arab cultural beliefs as a very strong predictor of resistance to systems and consequently, Information Technology Transfer (ITT). Additionally, technological culturization emerged also as another important factor in this context.

A better understanding of the impact of National Culture on ITT will allow making adjustments that may increase the likelihood of successful IT implementations in the Arab World countries. Consequently, as stated by Shore & Venkatachalam (1996), national culture is an important variable in many global studies. In this regard, they propose that cultural variations at both the national and organizational levels constitute two essential factors influencing the process of technology transfer. Accordingly, in this paper we emphasize the integral role of national culture in the Information Technology Transfer Process to the Arab world, while recognizing that organizational culture may serve as an intervening factor in this process which lies beyond the scope of our current research.

As further highlighted by Shore and Venkatachalam (1996), national culture plays a pivotal role in the transfer process, as differences between the headquarters and host organizations can lead to problems. The scholars propose that various factors such as the attributes of technology, variations based on societal culture, differences in organizational culture, and the absorptive capacity of recipient organizations may impede the transfer process. The importance of culture in the transfer and acceptance of technology will be the focus of the next section.

5. Culture and Technology in the Arab World

The study of the relationship between culture and technology has caught the attention of a number of researchers. It has taken a wide range of ways in cultural anthropology (Straub et al., 2003). Based on the above analysis of the two questions, it is essential to ask ourselves: What are the dynamics of the interrelationships between the Prevalent National Culture and Information Technology Transfer in the Arab world? and what are the issues and conflicts included in Information

Technology Transfer (ITT) particularly to Arab countries? The answer to these questions is not straightforward since the relationship between culture and technology has been viewed from different angles.

It is true that there is a growing body of literature discussing the general challenges associated with Information Technology Transfer to emerging nations and areas, such the Arab World. Therefore, some researchers (e.g, Hill et al., 2008; Straub et al., 2003) have revealed that ITT is frequently hindered by organizational, human, and technical issues in Arab cultures. As explained earlier, the Arab culture is complex (El Louadi & Everard, 2004). Yet, any transfer of Information Technology is even more complicated for a variety of reasons. This is mostly due to the distinctive features of the technology itself, the complicated processes required for its successful implementation, the dynamism of the technology, and the requirements for substantial amount of financial, physical, human, and technological resources (Al-Mabrouk & Soar, 2008).

6. Factors Influencing Information Technology Transfer

A considerable amount of research has highlighted the importance of the issue of cultural factors in such a way that clearly proves the success of ITT to the Arab world countries (Al-Mabrouk & Soar, 2009). For instance, Westerners who attempt to implement technology transfer generally face obstacles from cultural and societal factors regarding their own thoughts, beliefs, and values on how technology "should" be used in developing countries. These obstacles may sometimes lead to the failure of their initiatives. Moreover, a number of factors influence the success of Technology Transfer that are summarized as follows:

- The **Nature** of technology itself;
- Issues associated with activities of IT transfer such as **planning, implementation, and innovation and diffusion** ;
- **The capacity** of an organization to **absorb and adopt** new technology (Kasimin et al., 2009, p. 48)

As discussed in the fifth section, Shore and Venkatachalam (1996) examined the role of culture in their research. They stated that four elements could limit the process of transferring Information Technology: the inherent characteristics of the technology itself, societal culture-based differences, organizational culture differences, and the ability of recipient organizations to absorb new ideas. Hence, the abovementioned issues are highly influential in determining the success or failure of IT transfer to the developing countries in general and in the Arab countries in particular (see an in-depth analysis in Al-Mabrouk & Soar, 2009 for the interpretations of the top ten major issues for success of IT transfer in the Arab countries). According to Cobb & Barker (1992), the effective transfer of Information Technology to a developing country is thereby a more complex process than is frequently described.

It must be acknowledged that transferring technology developed within one culture to another culture entails more than just imparting technical knowledge on how to use the equipment. As stated earlier, cultural beliefs and values are a "collective programming of the mind which distinguishes the members of one human group from another" (Hofstede et al. 2010). Straub et al., (2003) highlight that :

Cultural factors are likely to be powerful explanations for why those from technically advanced societies who attempt to implement technology transfer are often challenged in terms of their own ideas, beliefs, and values about how technology "should be" utilized in developing countries... Cultural factors also likely explain why transference of IT to developing countries is fraught with problems (Straub et al., 2003, p. 144).

Information Technology is typically transferred from technologically advanced countries- like the United States, Western Europe, or Japan- to developing countries -like Algeria, Tunisia, or Saudi Arabia. This process usually involves incorporating highly industrialized world technology alongside its associated methodologies into a host developing nation (Straub et al., 2003). Scholars (e.g., Hill et al., 2008) claim that effective technology transfers often take place when the new technology corresponds with the pre-existing culture. It turns out, that technology created and manufactured in industrialized countries is likely culturally biased in favor of advanced sociocultural systems, and technology exported to developing countries faces resistance from local cultures. The transfer of technology is a critical component of the competitiveness of developing countries, particularly Arab nations. Thus, it is evident that cultural issues are just as important to the success of the IT transfer process as political, economic, and social issues.

7. Studies on National Culture and Information Technology Acceptance & Transfer

A plethora of research studies have shown culture as a key factor influencing the use of Information Technology (IT) by individual, organization and societies (e.g., Alhashemi & Weistroffer, 2017; Hill et al., 2008; Shore & Venkatachalam, 1996; Straub et al., 2003). According to Karahanna et al. (2000), for example, national culture affects the adoption of Information Technology. In this regard, the researchers Leidner and Kayworth (2006), after an extensive literature review, confirmed the culture has an impact on the adoption and use of Information and Communication Technology (ICT). They came to the conclusion that the adoption or use of ICT is influenced by the alignment between the values of national cultures and characteristics of an ICT.

A study conducted in 2003 by Straub, Loch, and Hill investigated Information Technology Transfer (ITT). Arab society served as the study's background. One of the world's most intricate social and cultural systems may have been the setting for

their "cultural influence" model testing. A combination of qualitative and quantitative methods were employed to examine the ITT phenomenon. The results showed that technology culturation played a role as well as Arab cultural beliefs, which were a powerful predictor of resistance to systems and, consequently, ITT.

Furthermore, other researchers in the Arab world opted for the inclusion of the construct of "Culture" into established Technology Acceptance Models (Al-qeisi et al., 2015; Makhoulf, 2021; Rabaa'i, 2017). For instance, Rabaa'i examined factors that determine the adoption of e-government services in Jordan. The researcher adopted a modified version of the Unified Theory of Acceptance and Use of Technology (UTAUT). The study attempted to investigate whether and how national culture has an impact on e-government adoption. A survey questionnaire was used as the main research tool. Based on the assumption that cultural differences account for several particular impacts, the results revealed that Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Behavioral Intention all have a major impact on the adoption of e-government services in Jordan.

To the best of my knowledge, there is only one recent empirical study carried out by Makhoulf (2021) who examined the cultural perceptions of EFL Secondary School Teachers regarding the adoption of ICT in the Western District of Chlef, Algeria. The findings of the study revealed that EFL teachers demonstrated a moderate positive cultural perception of ICT and were excited about its potential to bridge cultural divides. The participants responded that they would like computers that accurately represent the culture and identity of an Arabic-speaking community.

8. Conclusions

The current paper has identified a scarcity of empirical research concerning the role of national culture in the successful transfer of Information Technology in the Arab world. Technology transferred to developing and Arab countries meets cultural resistance. Consequently, the lack of understanding or ignorance of the cultural context can lead to stagnation or failure in the IT transfer process. The industrialized countries need to comprehend the necessary components for successful IT transfer process to the Arab World.

National culture plays an important role in ITT in the Arab world. Transferring technology from its nation of origin to another nation involves infusing the technology and its related cultural methods to the hosting culture. It is not necessary to consider culture to be an obstacle to Information Technology Transfer (ITT). In fact, culturally appropriate IT design and implementation that takes into account the varied influences of culture on ITT can encourage and foster its transfer more effectively. This process can "Arabize" technology successfully (Straub et al., 2003). Thus, the use of particular cultural components of Arab culture in the ITT process will boost the transfer process to succeed and not to fail.

In summary, this article makes a conceptual contribution to the existing literature, namely ITT. It introduces a novel conceptualization of how national culture influence the transfer process of Information Technology to the Arab world.

9. Implications and Future Recommendations

In the Arab World, Culture and Information Technology Transfer studies are very limited. This study represents an initial attempt to explore information about the influence of “national culture” on “Information Technology Transfer” to the Arab world context. Other developing countries may use the results of the current study as a benchmark to stimulate additional empirical research in this area. This analytical review is intended to serve as a point of reference for researchers in the future for a comprehensive understanding of the POWER of cultural factors for the success of Information Technology Transfer, with a focus on the Arab world in particular.

We argue that if national culture plays a significant role in the transfer of information technology, then the process of transfer needs to include explicit consideration of cultural technology values (Shore & Venkatachalam, 1996). The current study implies that national culture must be incorporated into the IT transfer plan as it may play a crucial role in the information technology transfer process, irrespective of organizational structure.

Even though research on the adoption and usage of IT across cultures has advanced, additional empirical investigations are still required to develop theories that predict how national culture influences IT transfer in advance. Therefore, researchers are highly recommended to conduct more empirical studies on the interactions among the cultural factors for successful transfer of Information Technology in the Arab world by developing Cultural Influence Models and Frameworks of the Transfer of Information Technology in the Arab world. It is expected that by having a more thorough knowledge of the impact of national culture on ITT, improvements may be made to increase the potential for successful technology adoption in Arab countries.

It is hoped that the recommendations for strategies for a more successful Information Technology Transfer into the Arab World will provide useful directions for policy-makers at both national and regional levels in countries facing similar challenges in establishing ICT that will be welcomed by other stakeholders (such as teachers and students).

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