The Impact of Culture on the Adoption and Use of IT in the UAE: A Study Towards Bridging the Digital Divide Between the UAE and the Developed Countries

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ABSTRACT

Culture is thought to be probably the most difficult to isolate, define and measure in the adoption and use of IT. Consequently the impact culture on the adoption and use of IT does not feature prominently in the literature. As cultural factors may be important to the success of IT adoption and use, this research project was aimed at a focused study of its impact on the adoption and use of IT in the United Arab Emirates (UAE). The results of the study was compared along eight cultural dimensions and contrasted with a study (Hasan & Ditsa, 1997, 1999) on the adoption and use of IT in developing and developed countries. The results of this study were also used to identify issues of concern with the relationship of culture and IT and their implications for IT adoption and use in the UAE. The study results were further used to suggest ways of bridging the digital divide between the UAE and developed countries.

INTRODUCTION

Technology is believed to be culturally neutral and that the process of development, adoption and use of technology is uniform across countries, once basic economic and political conditions are satisfied (Review of the World Bank 1994). The review observed that many technology projects, including IT, in developing countries fail because the designs were not sufficiently tailored to those countries' history and industrial traditions. There are problems that cannot be attributed to the technology process, but rather the cultural differences between designers of the technology and the recipients. It is true culture may not be the only factor which influences the adoption and use of IT. Other such as economy, politics, social factors, education and skill levels may be deciding factors.

Hasan and Ditsa (1997, 1999) studied the adoption and use of IT in three regions of widely diverse cultures. They concluded that culture is an important ingredient in the identity of the IT products themselves and influences the impact of IT adoption and use in different cultures.

Following from the studies of Hasan & Ditsa (1997, 1999) and Ditsa (2005), this research carried out a focused study on the impact of culture on the adoption and use of IT in the UAE. The results were compared along eight cultural dimensions and contrasted with the studies of Hasan & Ditsa, (1997, 1999). The results of the study were also used to identify issues of concern for the relationship of culture and IT and their implications for IT adoption and use in the UAE. The study results were further used to suggest ways of bridging the digital divide between the UAE and the developed countries.

DEFINITIONS
Culture
Culture can be thought of as the beliefs, philosophy, shared values, attitudes, customs, norms, rituals, common practices, and traditions which govern the ways of living of a group of people. Macquarie Dictionary defines the culture of a society as:

"The sum total of ways of living built up by a group of human beings, which is transmitted from one generation to another."

Hofstede (1991, p.5) defines culture as: "the collective programming of the mind which distinguishes the members of one group or category of people from another". More simply, culture is shared values of a particular group of people (Erez & Early, 1993) and culture reflects the core values and beliefs of individuals, which are formed during childhood and reinforced throughout life (Shore and Vankatachalam, 1996). This implies that culture is all pervasive and has a strong influence on all our undertakings. It is not however easy to measure and hence is a difficult variable to use in a rigorous research.

Hofstede (1991) further looks at the manifestation of cultures as symbols, heroes, rituals and values, which he illustrates as the concentric skins of an onion, with the symbols forming the outer skin, followed by heroes, rituals and values in that order. Symbols are the most visible attributes of a culture, whereas values form its innermost and deepest manifestations and are difficult to change. Values, according to Hofstede, are broad tendencies to prefer certain states of affairs over others. That is, they are what make a group or a category of people distinguish between good and evil, clean and dirty, beautiful and ugly, natural and unnatural, normal and abnormal, logical and paradoxical and rational and irrational. According to psychologists these values are acquired unconsciously at an early age by the individual in a cultural group.

The Eight Cultural Dimensions
For the purpose of our study we adopted the eight cultural dimensions from Hasan and Ditsa (1999). Definitions of the eight dimensions are as follows:

- **Power Distance:** *The extent to which the members of a society accept that the power in institutions and organizations is distributed unequally.*
- **Uncertainty Avoidance:** *The degree to which members of a society feel uncomfortable with uncertainty and ambiguity.*
- **Individualism:** *Preference for a loosely knit social framework in which individuals take care of themselves and their immediate family as opposed to* **collectivism** *which is preference for a tightly knit social framework in which individuals expect their relatives or others in their group to look after them in exchange for unquestioning loyalty.*
- **Masculinity:** *Preference for achievement, heroism, assertiveness and material success as opposed to* **feminism** *which is preference for relationships, caring and quality of life.*

- **Time Orientation:** *A measure of people's consideration of the future.* Long-term orientation is characterized by people who persevere methodically toward results and save for the future whereas short-term orientation is characterized by people who expect quick results.
- **Monochrony and Polychrony:** *Cultural dimensions describing attitudes towards the use of time in performing tasks.* In Monchronous societies people focus on issues one at a time and emphasize schedules and procedures for task completion. In Polychronous societies people perform activities in parallel and focus on task completion rather than adherence to procedures.
- **Context:** *The amount of information that surrounds an event, inextricably bound up with the meaning of that event.* In a high context culture the information surrounding an event is already in the person, and very little is in the coded, explicit, transmitted part of any communication between participants. In low context cultures the mass of information is vested in the explicit code.
- **Polymorphic and Monomorphic:** *Cultural dimensions which relate to the influence of opinion leaders.* In polymorphic cultures, such as traditional villages and farming communities, the expertise of leaders or managers is assumed to span a wide range of issues, whereas in monomorphic cultures, such as modern industrialized societies, a manager's scope is limited to his or her explicit areas of expertise.

Digital Divide

There is growing disparity in the use of IT between the developed and developing countries. While developed countries are harnessing IT to revolutionize their operations of their industries, developing countries, on the other hand, appeared not to have the capabilities or the urge to do so. The disparity which exists in access to and use of IT between countries and between groups within countries is what is referred to today as the "digital divide". The growing disparity in the adoption and use of IT also results from the culture of a people (Ditsa, 2005).

THE STUDY
Methodology

The methodology used for this research is both qualitative and interpretive following the model proposed by Miles and Huberman (1984), which incorporates the four phases of: data collection; data reduction; data display; and the verification and drawing of conclusions. The data for analysis was collected from a set of organizations in each cultural region which were chosen to be as diverse as possible in size and industry type. The researchers took particularly care to select, where possible, representatives of the local IT community rather than foreign advisers or members of multinational corporations.

All the data was text-based and comprised of organizational documents and transcripts of semi-structured interviews with IT staff at both managerial and operational levels. In these interviews the researchers recorded answers to specific questions on: the history and use IT in the organizations; the method of acquisition and development of information systems; and the attitudes of operation and management staff involved in IT. The researchers also recorded any informal discussions that followed. As soon as possible after each interview, a full report was written based on the notes taken. Follow up interviews were conducted as soon as possible when we felt the need for further explanation for the data collected.

These reports and documents were then analyzed by using a process of data reduction with the selection and arrangement of relevant items. We extracted only that data which relates to culture as defined in this paper. The data was arranged along those dimensions and is displayed in Table 2 of this report. An interpretation of this data into generalized issues was then made and presented in the concluding sections of the paper.

Data Collection Methods

The data used for this study is descriptive in nature and the method of collection of the data is as follows. Interviews were conducted and observations made on the adoption and use of IT in two organizations in Al Ain, and one each in Abu Dhabi and Dubai. Before the data collection visits, preliminary contacts were made with these organizations. The organizations and interviewees were appropriately informed about our study. For obvious reasons, we agreed to guarantee the anonymity to some extent of all the organizations involved in this study.

In each organization, at least one interviewee was selected who had been involved in IT since its first introduction into the organizations. Evidence was also taken from the scarce literature of other case studies on the adoption and use of IT in the chosen organizations. Comparisons were then made with the wealth of data on IT in a Western developed country, Australia.

The Three Chosen Cultural Regions for the Study

Based on the studies of Hofstede (1983a, 1983b, 1984, 1991) and Hofstede et al. (1990), we have identified two distinct cultural regions in addition to the **UAE**, which is the focus of this study. The two are West Africa, which is in the developing world, and Australia, which is a developed country with Western culture.

Australia is one of the developed or industrialized nations which form about 25% of the world population but produce and consume about 12 times more per capita than the Third World countries (ABS, 1998). Australian companies play in specialized areas of IT. Most Australian organizations rely on IT for daily operations and strategic decision making.

Australian culture is very egalitarian resulting in an extremely low PD and a monomorphic structure where people are only respected for their own area of expertise. Australia culture is also individualistic and masculine and, perhaps being predominantly a nation of immigrants, Australians are generally venture-some and innovative. Per capita, Australia is a world leader in the use of new technology.

In contrast with Australia, the **UAE** represents the old and even ancient world, although the country can be considered as young. The UAE, like other countries in the Middle East, has some commonalities of culture, language and religion with countries of Northern Africa, and the other Islamic countries of the Levant and the Arabian peninsular. The use of IT in the UAE has grown tremendously in the last few years. Government IT initiatives appear to be towards making the UAE the technology capital of the region. These can be seen in establishment of educational institutions, the Knowledge Village, Dubai Silicon Valley, annual fairs such GITEX and Global Village to promote IT. The use of IT is widely encouraged in both public and private sectors. Examples are eGovernment initiatives in Dubai and Al Ain, and the police force. The presence in the country of giants in the IT industry (such as Oracle, Dell, IBM, Cisco, and Microsoft) attests to this. This is also evident in the use IT in the financial and other sectors.

Hofstede's (1991) cultural study in the **West African** region included Ghana, Nigeria and Sierra Leone and our study in this region focused on one country, Ghana. Apart from Liberia, which was created after the abolition of the slave trade, all other West African countries were once colonized. Ghana was at one time or another colonized by the Portuguese, the Spaniards, the Danes, the Dutch, the Germans, the French and, lastly, the British. The colonial legacies left in these countries are very obvious in their national and organizational administrative structures, languages and educational systems. For example, the official language of Ghana is English, as is that of Nigeria and Sierra Leone, whereas that of Burkina Faso, Cote d'Ivoire and Togo, is French.

According to Hofstede's (1991) study, the cultures of this region are very similar and despite the colonial rules which brought with them foreign cultures, the cultural identities of these countries still remain unique. Traditional cultures still permeate organizational cultures. The basic family values with extended family systems still dominate in this region.

DATA REDUCTION AND DISPLAY
Comparative Cultural Indices

Values of the eight cultural indices for each of the three cultures chosen were estimated from the literature. These values were also verified by representatives from the cultures used in the study and are shown in Table 1.

Summary Cultural Comparison of the Three Regions on the Eight Cultural Dimensions

From the analysis of the data collected in the study, a summary was made of instances where the value of each of the eight cultural indices was related to IT issues in each of the three cultures. These results were then verified with a representative from each of the three cultures and are presented below with a tabular summary in Table 2.

Table 1. Values of the three cultures along the eight cultural dimensions

	AUS	WA	UAE
Power Distance	Low	High	High
Uncertainty Avoidance	Moderately Low	Low	High
Individualist vs Collectivist	Highly Individualistic	Highly Collective	Collective
Masculinity vs Femininism	Masculine	Feminine	Masculine
Time Orientation	Long-term	Short-term	Short-term
Monochrony vs Polychrony	Poly	Mono	Mono
Context	Low	High	High
Polymorphic v Monomorphic	Mono	Poly	Poly

APPLICATION OF THE RESULTS TO THREE ISSUES OF CULTURE AND IT

From the results of this study we deduced three issues (Cultural identity of IT, Cultural Values of IT, and Impact of IT on Culture) that the eight cultural dimensions can be broken down into as summarized in Table 3.

It should be noted that most of the cultural indices of West Africa and the **UAE** are similar and in opposition to most of the values embedded in IT by Western culture, particularly along the dimensions of Power Distance, Individualist/Collectivist, Time Orientation, Context and Monochrony / Polychrony. The latter two dimensions are particularly interesting in regard to modern, interactive, windows-based systems which are becoming popular all over the world. These would seem to suit high context cultures and be at odds with the Monochronous nature of the work of a traditionally trained analyst-programmer concerned with structured algorithms and abstract data types.

IMPLICATIONS FOR THE IT INDUSTRY

The key area of concern for the relationship of culture and IT is the realization that many aspects of IT are not culturally neutral. Most of the popular commercially available hardware and software emanates from the US and similar Western cultures. Our study has focused on many of the issues that arise when people in different cultures use IT.

Of the eight dimensions of culture that we have used in this study, at least three could be thought of as inherent in the currently available technology, most probably because of its Western origin. These three are power difference, uncertainty avoidance and time orientation. Most IT products and projects suit cultures with low PD, low UA and long-term time orientation in the following ways:

- **PD** - Those in power in cultures with high PD are often fearful of the open nature of modern IT.
- **UA** - Adopting any form of IT is risky but there may be a greater risk of not joining the global IT community.

Table 2. Summary of the cultural comparison of the three regions on the eight cultural dimensions

	AUS	WA	UAE
Power Distance	IT has flourished in this low PD culture as networked organizations develop flatter management structures.	In this high PD culture, IT is often an imposition on organizations from the top without taking advice from IT staff.	In this high PD culture governments want to control IT and are concerned with its power to democratize society.
Uncertainty Avoidance	People here are prepared to take risks and ready to adopt new IT, resulting in successful innovation.	Also prepared to take risks but many unwise and risky projects are undertaken and a lot of incomplete IT projects are observed.	In this high UA culture there is almost no R&D. They accept only well established IT products from the developed world.
Individualist vs Collectivist	The individualist characteristic of this culture is exemplified in the typical solitary image of a dedicated computer programmer.	Here there is a collective attitude towards solving IT problems by teams of IT professionals. This has the potential to produce good IT solutions.	Most IT projects are initiated by people trained in the west who have individualist skills, whereas locals usually prefer to work in teams. This is a source of conflict in joint projects.
Masculinity vs Femininism	IT development has been predominantly technical and male oriented. Women are becoming more prominent as the number of less technical positions grows.	Both males and females vie for top jobs in the IT industry and people are more interested in what the technology can do rather than technical details.	Most jobs in IT are held by men but IT is providing jobs for women. This is welcomed by those trying to raise the position of women but is seen as a threat in conservative circles.
Time Orientation	Most organizations have a three to five year IT strategies and think reasonably long term.	Short-term planning is prevalent, so that only the results of today determine success and are rewarded	Management want quick results and do not appreciate the time value of money. Many organizations retain inefficient manual systems.
Monochrony vs Polychrony	Modern interactive, multi-tasking systems encourage polychronous work and are popular.	IT professionals prefer completing one job before taking another: a display of monochronous culture.	Batch systems were readily adopted and many have not been upgraded. This is indicative of a monochronous culture.
Context	System developers are good at low level development which requires detail and abstraction.	Interested in getting a system in place without much attention to details.	Seems to prefer modern high level end-user development tools which suit a high context culture better than traditional programming.
Polymorphic vs Monomorphic	IT management is separated from core business resulting in problems of communication: a display of a monomorphic culture.	IT managers are expected to have knowledge of every aspect of IT and the organization: a display of a polymorphic culture.	Managers are expected to deal with IT issues without being trained in IT: a display of polymorphic culture.

Table 3. Three aspects of IT and culture for each of the eight cultural dimensions

	Cultural identity of IT	**Cultural Values and IT**	**Impact of IT**
Power Distance	IT implies and supports a low PD culture.	IT can change the power base of organizations in high PD cultures giving skilled IT workers equity with managers.	IT can lower PD or be used to reinforce control.
Uncertainty Avoidance	IT is risky and has flourished in low UA. In today's world it is also risky not to adopt IT which poses a dilemma for high UA cultures.	High UA cultures may only adopt "safe" older IT and be less competitive in the global arena.	The global economic imperative of IT may have the effect of lowering UA as business are force to take the IT challenge.
Individualist vs Collectivist	Traditional IT suits Individualists but modern systems such as GSS and the Internet suit Collectivists.	IT can suit the individual or the group. It can support individual or cooperative work practices.	IT empowers individuals in collective cultures. It also creates groups across time and space.
Masculinity vs Femininism	IT has been male dominated, with a focus on the technology for its own sake. A Feminine attitude is people oriented and focuses on the end-user of IT.	Whereas the older IT systems fitted into masculine societies, feminist cultures feel more comfortable with modern user-friendly systems.	Older IT systems enforce a technological masculine way of working whereas the more modern usable systems promote feminine cooperative work practices.
Time Orientation	The changing nature of IT makes long-term planning difficult but critical. There is a need to plan long-term but also be flexible.	The need for long-term planning in a rapid changing environment can cause problems in cultures with short-term time orientation	The current climate of constant change is making people more flexible but also put more effort into anticipating future requirements.
Monochrony vs Polychrony	IT exhibits both these time aspects of work (eg Monochronous batch processing and Polychronous interactive multi-processing).	The popularity of modern windows systems in the West is in part because they support Polychronous work.	Older IT forced many into monotonous Monochronous jobs. Modern systems support Polychronous work and increase job satisfaction.
Context	IT has traditionally required explicit analysis and abstraction consistent with a low context culture.	The object oriented development approach may suit more high context cultures as it is more oriented to objects in the real world and integrates data and process.	Traditional IT has imposed its language and mode of operation on all users. It teaches problem solving skills and data abstraction with low context.
Polymorphic vs Monomorphic	IT works best when organizations combine technical and business knowledge. This is compatible with a Polymorphic culture.	Leaders in polymorphic cultures have problems with IT because it is such a specialized area of which they know little, yet they are expected to show leadership in IT adoption.	In the past IT has been run by IT specialists, however modern organizations are successful if the CIO has both business and IT expertise.

- **Time Orientation** - Some forward thinking and long-term strategy is needed to choose the best IT path for any country or organization.

Across the remaining five dimensions of culture, it is possible to choose appropriate technology for particular cultures. These could be:

- using groupware techniques in collective cultures, as opposed to single user systems which are more appropriate in individualistic cultures;
- more technical approaches to development in masculine cultures and more people oriented approaches in feminine cultures;
- using modern visual and object-oriented programming package for more high context cultures and more traditional algorithmic methods for low context cultures;
- highly interactive systems are easily accepted in polychronous cultures whereas linear systems suit monochronous cultures;
- monomorphic cultures readily accept specialists whereas in polymorphic cultures managers must have broader more generalist training, as they are expected to be experts in everything.

LIMITATIONS OF THE STUDY
More data is always desirable. It would have been useful to increase the number of organizations in the study and across the seven Emirate of the UAE. These would have required more time and resources, which in the current study were very limited.

CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH
This study suggests that cultural impact on IT adoption and use cannot be ignored. Culture is an important ingredient in the identity of the IT products themselves and influences its adoption and use. Problems will arise when there are differences between the culture of an IT product and the culture of its user. We discussed this under the heading of three issues: the Cultural Identity of IT, Cultural Values and IT and the Cultural Impact of IT.

As the use of IT expands globally, there is need for further research into cultural aspects and implications of IT. A greater understanding of the various dimensions of culture, as applied to IT and the people who use it, will lead to more globally acceptable IT products and better choices for IT.

From the results discussed, suggestions can be made to the **UAE** government and the private sectors to encourage more use of IT in order to bridge the digital divide between the country and the developed countries. This may mean more provision of resources, education towards modernizing aspects of culture that inhibit the successful us of IT, providing tele-cottages to educate that section of the population that is computer illiterate. There will also be the need to encourage more use of IT at all levels of the educational sector. Teaching of IT at these levels should highlight the cultural aspects that inhibit the successful use of the technology.

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