

## **A Transcultural Model of E-Governance for the Healthcare Industry**

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### **ABSTRACT**

This research crafts an effective e-governance model that systematically applies relevant prerequisites to a successful transcultural e-governance project, drawing empirical evidence through its application to a specific healthcare industry sector. As e-governance in transnational enterprises (TNEs) would involve global technology transfers from the original project context into a different socio-cultural environment, our e-government model will incorporate and infuse cultural factors to facilitate technology transfers and acceptance.

**Background & Purpose** - E-Governance is a set of technology-mediated processes that has become an accelerating corporate trend for streamlining internal and external strategic initiatives among 192 United Nations members, including USA, Sweden, Poland, and UK (UN E-Government Survey 2008). Though e-government has involved governmental use of information technology to provide information and services to citizens and stakeholders, 'e-governance' has become a broader concept to describe changing institutional relationships and consequent stakeholder benefits. Many launched e-governance initiatives have been ill conceived and substandard, yielding suboptimal results—if not costly failures. This research is hence geared to crafting a unified model of an effective e-governance model that systematically combines the pre-requisites to a successful transcultural e-governance project, drawing empirical evidence through its application to a specific healthcare industry sector. As e-governance in transnational enterprises (TNEs) would involve global technology transfers from the original project context into a different socio-cultural environment, our e-government model will incorporate and infuse the cultural factor to facilitate technology transfers and acceptance. This paper aims to present the following model in a composite framework: (1) E-governance culture model; (2) e-governance construction model; (3) e-governance infrastructure model; (4) healthcare knowledge management model; and, (5) e-governance technology acceptance model. These models are then conceptually integrated to form a successful E-governance Implementation Model. The overall e-governance implementation model and its components are then supported through various case studies in the healthcare industry.

**Design/methodology/approach** - This research is theoretical, examining relevant theories and reviewing the literature on e-governance.

**Findings** - A pragmatic, integrative, and strategically viable model of e-governance implementation for the healthcare industry has been developed for further refinement and

best practice applications across industry sectors.

**Research limitations/implications** - This research provides an integrative, conceptual model that needs to be tested in real or simulated healthcare industrial environments to be of pragmatic value.

**Practical implications** – With e-governance in the healthcare industry as exemplar, this research can be a potential framework for the launch of e-governance initiatives by countries and institutions seeking successful implementation of e-governance.

**Originality/Value** – This paper develops a new, integrative model of e-governance implementation that takes into account the culture factor in an increasingly globalizing environment, and should appeal to both practitioners and researchers.

**Paper Type** – Theoretical - literature review, conceptual, model-development

**Keywords** - E-governance, transcultural, healthcare, technology acceptance

## INTRODUCTION

E-Governance is a set of technology-mediated processes becoming an accelerating corporate trend for streamlining internal and external strategic initiatives in a number of countries. This theoretical paper examines relevant theories and reviews literature on e-governance. In this effort, it crafts a unified implementation model of effective e-governance that systematically combines pre-requisites to a successful transcultural e-governance project. For this, it draws empirical evidence through its application to a specific industry sector—healthcare.

At this time of growth and transition, many launched e-governance initiatives have been ill-conceived and substandard, yielding suboptimal results—if not costly failure. As e-

governance in transnational enterprises (TNEs) would involve global technology transfers from the original project context into a different socio-cultural environment, the proposed e-government model will incorporate and infuse the cultural factor to facilitate technology transfers and acceptance.

This paper aims to present the following models comprising the conceptual integrative e-governance implementation model: (1) e-governance culture model; (2) e-governance construction model; (3) e-governance infrastructure model; healthcare knowledge management model; and, (5) e-governance technology acceptance model. The overall E-governance Implementation Model and its components are then examined for empirical support through various case studies in the healthcare industry.

## **E-GOVERNMENT AND INFORMATION, COMMUNICATION, AND TECHNOLOGY (ICT)**

Sahraoui (2005) defines e-government as governmental information and communication technology (ICT) enabled activities and services to improve accessibility, effectiveness, and transparency. Electronic government (e-Government) is also referred to as digital government, online government, or transformational government (Palvia & Sharma, 2007). Information technology (IT) is used as a platform to exchange information and services for citizens, businesses, and governments. In summary, an e-government project is launched to place a government in a transparent environment to improved public service and citizens' trust. This is accomplishable by: (1) improving collaboration(s) with government, (2) enhancing ICT efficiencies; (3) streamlining man-machine interfaces; (4) optimizing

audience participation through understanding of cultural sensitivities; and, (5) strengthening good governance.

According to Berce, Lanfranco & Vehovar (2008), ICT is a blend of hardware, software and conveniences to communicate. Hardware is the computing equipment; software is system/application program; and communication is possible through local area networks (LANs), wide area networks (WANs), backbone networks, and communication protocols.

As Palvia & Sharma (2007) elaborate, a government agency (G) interacts with outside constituents including citizens (C), business (B), another governmental agency (G) or employees (E). Separate governmental agencies perform activities such as tax collection. Such revenues give birth to services—defense, security or health care through the government. To perform such activities, governmental agencies deploy ICT, henceforth referred as ‘electronic’ government or e-government. The primary non-commercial delivery models for e-government are: (1) G2C—Government-to-Citizen, (2) G2G—Government-to-Government, (3) G2E—Government-to-Employees and, G2B—Government-to-Business.

G2C is a web portal allowing individuals to interact with local/central government. According to Chanana (2007) G2C services can be online land records including archiving, property registration, and online record handling. Palvia & Sharma (2007) mention that G2C is a one-stop online service allowing citizens to retrieve information such as tourism details or payment of income taxes online. Another type of G2C is e-democracy where elected representatives interact with citizens through e-voting.

G2B is also a web portal allowing commercial businesses to interact with local/central government. An example of G2B is: <http://www.berr.gov.uk>, (department of business enterprises and regulatory reforms of UK) and <https://www.e.gov.bh/wps/portal> (e-government site for Bahrain).

G2E or 'e-governance' serves employees to automate workflow, track files, manage human resource, assets, projects, and promote e-learning. Palvia & Sharma (2007) mention that G2E conceptually falls under the umbrella of e-governance. Within these three domains either information is pushed down from the government to the outside constituents, or a two-way communication is initiated between outside constituents using online forums.

E-government can be an Internet or a non-Internet infrastructure. Non-Internet infrastructure utilizes technologies such as telephone, SMS, biometric identification, TV and radio. Sub-categories of e-government are m-government (mobile government) as described by Trima & Sheng (2008). Here, mobile technologies such as cellular phone connect using WiFi (wireless LAN) user to the Internet.

As Li (2005) states, e-government is cost effective. Its service deliveries are simplified once layers of government management are eliminated, achieving quicker responses to needs of the outside constituents. Also, e-governance provides (1) G2C the opportunity to host one-stop-point services, (2) G2B the opportunity to utilize better technology to reduce government's burden on businesses, and (3) G2G the opportunity to facilitate better communication when reporting and partnering in projects.

## **E – GOVERNMENT INITIATIVE – GLOBAL VIEW**

Tehrani (2007) confirms that over 160 countries host an e-government initiative since this efficient tool meets their challenges. Certain regions lag behind as they require the communication infrastructures or access to Internet and/or their end-users are not computer literate. According to UN's 2008 E-government Survey, the top five e-government-ready countries comprising 192 UN members are Sweden: (0.9157), Denmark (0.9134), Norway (0.8921), USA (0.864), and Netherlands (0.8631). Central Asian (0.3881), Southern Asian (0.3395) and Central African (0.4514) countries lag behind, below world average. In Europe, 53% of interaction is G2B and 42% is G2C—thus making Europe e-government ready.

Pilling & Boeltzig (2007)'s online survey of 12 major services including human services and education) in 22 countries show the USA and UK achieving most of their online services through the Internet. 99% of USA services and 92% of UK services are online—thus bringing these two countries on the top ten list of the e-government index. One disadvantage of e-government in USA and UK is that e-government services did not reach the elderly and the disabled who also earned low incomes and experienced inaccessibility to the Internet, and/or were not computer literate.

## **E-GOVERNANCE AND GOOD GOVERNANCE**

Palvia & Sharma (2007) view E-governance as a much wider concept than e-government. Therefore, E-government is a subset of e-governance. E-governance is an IT-driven system of governance to service outside constituents' needs cost effectively 24 hours a day. As commented by Contreras (2002) good governance provides an ethical ground for e-government composing factors such as equity, democracy, and transparency. Also, Backus

(2001) defines good governance as an exercise for political, administrative and economic authorities to better manage affairs of the country at all levels.

According to Palvia & Sharma (2007), E-government focuses on citizens and businesses. From the outside, both seek linkages with the government using e-government infrastructures. However, the focus of e-governance is on management and administration within a public, private, small or large organization. Hence e-governance becomes the inside focus of a public sector (governmental agencies) or private sector (small or medium size enterprises). Here, an Intranet facilitates e-governance. E-government falls within the outside focus of both public and private sectors where Extranet and Internet are the preferred telecommunication networks facilitating e-government. While E-government is a development of online services, e-governance is a broader concept dealing with a whole spectrum of relationships and networks within government.

Agarwal (2006) differentiates between governance and e-governance. Governance is a politics, policies and programs outcome representing long-term foresight. E-government is a short-term foresight focusing on immediate decision-making. Governance holds processes and institutions (ministries) to guide and restrict the collective activities of a group. E-governance is a model for governance to seek processes that harness the potential of ICT at various levels of the public sector. According to the UN, good governance is a voice with focus on participation and the ability to come to an agreement and orientation. Therefore, promotion of good governance is a pre-requisite for development.

According to Backus (2001), e-government is an e-business within the governance environment with a processes and structures objective contributing to the delivery of e-

services for the public (citizens and businesses and collaborating business partners). On the other hand, e-governance is the application to enable interactions between a government and its outer constituents.

### E-GOVERNANCE CONSTRUCTION MODEL

As per Backus (2001) an e-government model from an e-governance perspective is an E-governance model (Figure 1) built in four phases.

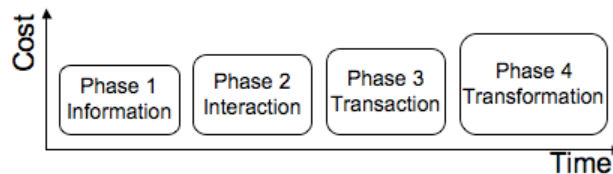


Figure 1. E-Governance model.

Source: Backus (2001)

In the *information* phase, most governments start with a web presence (online brochure catering) to improve democracy and transparency. In the *interaction* phase various applications simulate interactions between G2C and G2B to facilitate communication and querying using emails, search engines, and downloading forms. In the *transaction* phase technology becomes more sophisticated, thus enhancing value for the public. A complete transaction is made possible using online portals that perform procedures such as income taxes, online voting, or visas applying. The *transformation* phase integrates information systems together to host all services from one single point.

Sekir, Debnath, Bharadwaj & Chandi (2006) described an E-governance Framework, (Figure

2 below) composed of 4 parts: (1) Project assessment of sustainability – PAS; (2) eServices development; (3) Re-usable elements; and, (4) Inter-operability standards.

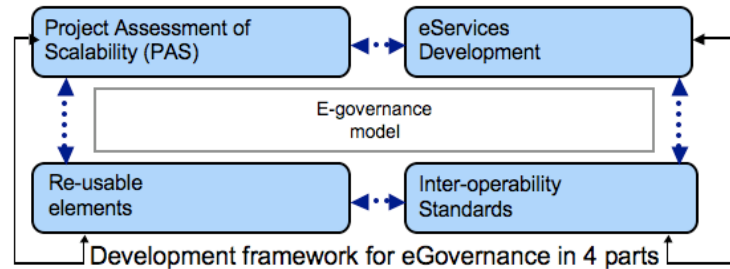


Figure 2. E-Governance construction model.

Adapted from: Sekir, Debnath, Bharadwaj & Chandi (2006); Backus (2001)

Since e-government is a subset of e-governance, the e-governance model encapsulates the e-governance framework. In Figure 2 above, the four parts of the e-governance sloping framework model work together where each part is also made up of: (1) policy makers' which are re-usable processes and design standards; (2) developers' standards of protocols and the specifications for developing online portal; and, (3) domain experts' standards pertaining to data.

As illustrated in Figure 3 ahead, the *blue book* (for policy makers) covers the development framework for e-governance extracted from the generic information model. The *pink book* (for developers' community) provides standards and models (information exchange model) to construct and deploy e-services. The *green book* (for domain experts) hosts standards to define governmental services data. PAS in Figure 3 below empowers projects and help maintain standards. E-service development builds a service through the five illustrated phases. Re-usable elements share and allow previously applied specification, design, pattern, services, codes, and technologies so that there will be no re-designing of the wheel.

Interoperability standards are the bases of reference for models and standards for referential and abundance purposes.

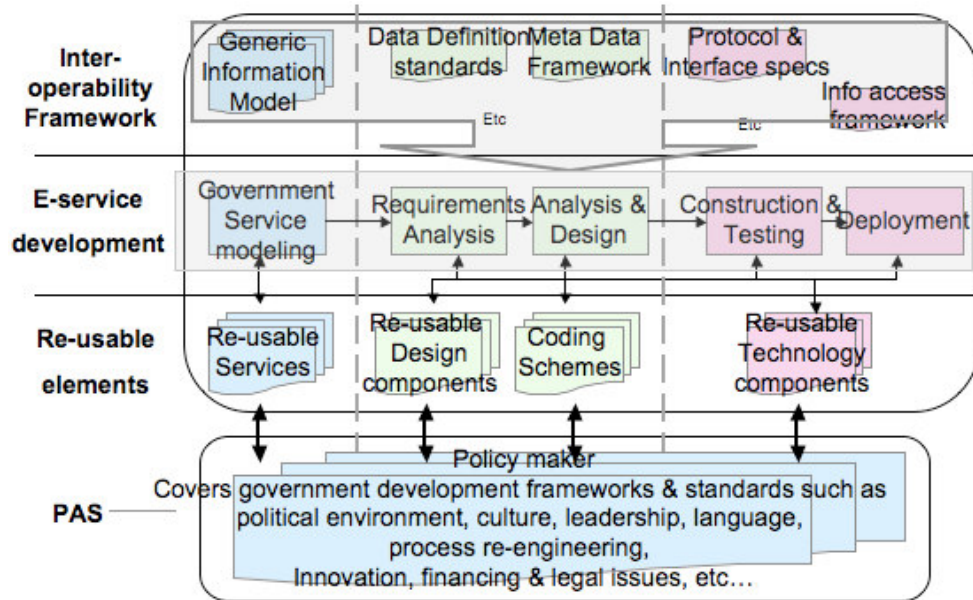


Figure 3. E-Governance framework model showing the 4 parts.

Adapted from: Sekir, Debnath, Bharadwaj & Chandi (2006)

### E-GOVERNANCE INFRASTRUCTURE MODEL

According to Contreras (2002), several factors encourage e-governance: (1) the radically changing value of information; (2) rapidly advancing communication technologies; (3) global economies supported by technology assisting citizens' participation with government; (4) organizational and ethnic cultures; and, (5) an increasing call for good governance. These factors form an E-governance Infrastructure Model and its pre-requisites (ICT and good governance). These areas are illustrated in Figure 4 below.

Further, Berce, Lanfranco & Vehovar (2008) analyze the relationships between ICT,

Knowledge Management (KM), and Learning Organization (LO). E-governance comprises governmental procedures associated with ICT to improve the activities of public sector organizations. This definition is decomposed into i-government and e-government. I-Government is aimed at converting existing paper-based objects and information processing into digital forms. E-government builds upon i-government to diffuse it with Internet-based digital services offered by government to citizens or businesses, thus converting manual, tangible services to virtual intangible services. Here, information exchange promotes a more knowledgeable workflow within a learning organization.

Thus, a LO responds to organizational knowledge to tackle the challenge of creating a culture of *managed* knowledge. Therefore, an organizational culture needs to be seriously considered to foster management of knowledge within and across to the outside of an organization. In a learning organization, the behavior or culture of employees is what makes organizational knowledge more effective. This means workers need to take on inter-related learning processes. E-governance Infrastructure Model illustrates this in Figure 4 below.

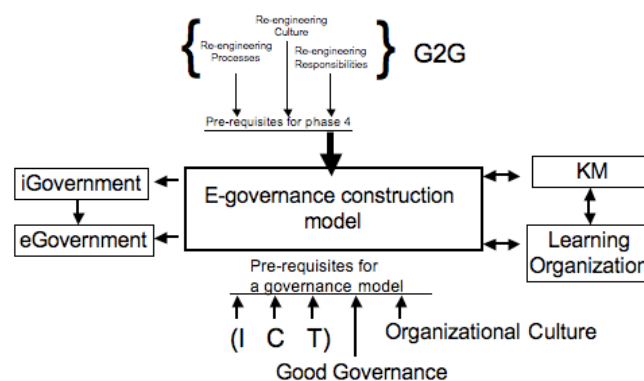


Figure 4. E-Governance Infrastructure model.

Adapted from: Contreras (2002) & Backus (2001)

Backus (2001) notes that during the third phase of the e-governance model a demand for e-procurement arises when users demand online security and end-user interface personalization requirements. Various processes need to be re-engineered from G2G perspective. The fourth phase of the e-governance model demands dramatic change in the culture, processes, and responsibilities within the governmental institution. Therefore, the models in Figure 1 & Figure 4 (above) illustrate these pre-requisites.

### E-GOVERNANCE HEALTHCARE KNOWLEDGE MANAGEMENT MODEL

According to Kakabadse, Kakabadse, & Kouzmin (2003). KM is attaining the right knowledge at the right time and in the right place while applying actionable information to improve organizational performance. An appropriate KM model for healthcare (Figure 5 below) is an integration of (1) a cognitive KM model, (2) network KM model, (3) community of practice model, and, (4) philosophical KM model. Lusignan & Robinson (2007) show: (1) evidence-based medicine (EBM) as an example of the philosophical KM model in the clinical environment; (2) clinical audit as an example for the cognitive KM model; (3) mentorship as an example of the network KM model; and, (4) community of practice as an example of the community KM model.

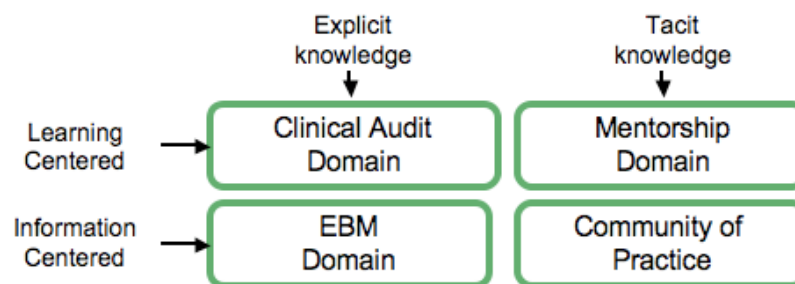
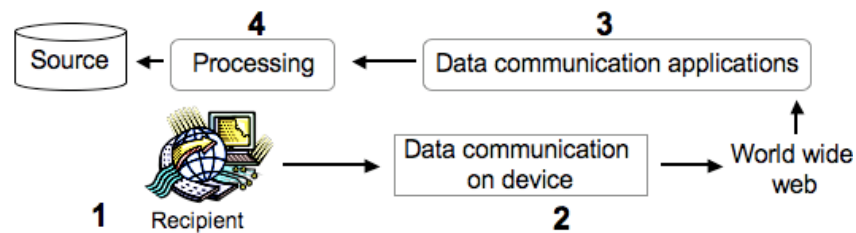


Figure 5. Healthcare knowledge management model (HKMS).

Source: Lusignan & Robinson (2007)

## E-GOVERNANCE ARCHITECTURE

Generic e-governance architecture is described by Saxena & Wadhawa (2004) in response to developing an effective e-governance system. The use of e-business Internet technology delivers solutions to improve knowledge flow. As illustrated in Figure 6 below, the E-governance Architecture Model assists the recipient (end-user).



*Figure 6.* E-governance architecture model

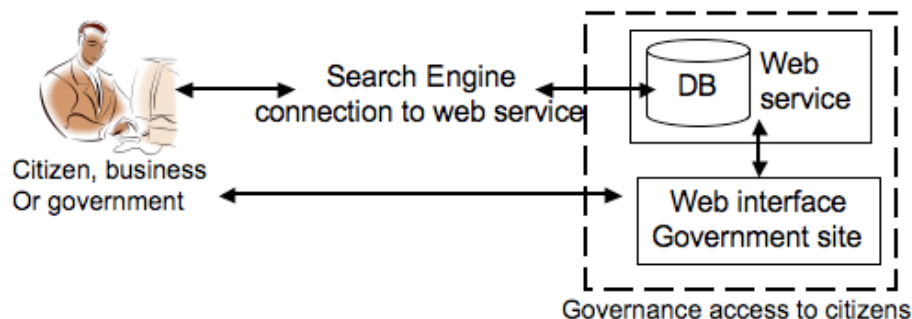
Adapted from: Saxena & Wadhawa (2004)

The end-user uses data communication software such as MS Internet explorer installed on a PC to connect to the Internet (World Wide Web). Such a device assists the recipient in connecting to a data communication application, that is, government's Intranet or Extranet. This network further connects the recipient to processing systems such as knowledge-based systems or information systems. This system processes data, information or knowledge stored in a source or repository.

## E-GOVERNANCE IMPLEMENTATION PRE-REQUISITE AND E-GOVERNANCE IMPLEMENTATION

Potekar, Bhusari, Hussain, & Satre (2004) state key factors for a successful e-governance initiative. These are staffing sufficient computers and software with strong technical support. Another factor is promotion of the public's awareness of the benefits of this implementation while providing professional training. Also, conducting social surveys amongst governmental staff helps in accomplishing a successful e-governance initiative. According to Jain & Awasthi (2004) the success of e-governance implementation lies in the quality of services and how effectively they reach the citizens. E-government reaches its citizens via published web pages that need maintenance and marketing for the citizens.

Guah (2006) defines web services as self-contained modular applications publishable and evocable over a network to provide computation upon request. Jain & Awasthi (2004) indicate in the model that outside constituents are able to access these web services by either logging on to their direct URLs or searching them through search engines such as Google. The dotted line in Figure 7 below (An Example of an E-governance Initiative Using Web-services) represents the e-government machinery that is composed of an automation system such as the database (DB), exposed web services, and the default implementation of the web services user interface.



*Figure 7.* An Example of an E-governance initiative using web-services

Adapted from: Jain & Awasthi (2004)

## E-GOVERNANCE CULTURE MODEL

E-governance in an increasingly transcultural environment needs to consider culture to avoid mistakes due to lack of cultural awareness and understanding. A culture context or culture setting is a communication platform that assists in understanding culture from the perspective of how different groups of people make sense of their world. Indeed, the culture of people consists of values, assumptions, and beliefs, comprising the ‘software’ of their mind (Hofstede, 1990).

There are strong forces of integration that result in sharing of diverse cultures within a given environment (Hofstede, 1990). As a result, members of each ethnic culture group share many value-relevant experiences and are socialized to accept shared social values (Schwartz, 1999). These cultural values in general depend on physical needs, social motives, and institutional demands (Schwartz & Bilsky, 1987). It follows that the goals chosen by managers to motivate employees will be more effective if they are compatible with prevailing cultural values (Schwartz, 1999). This means that the contextual orientation of employees in adopting the e-governance implementation model must take into account whether the individual's orientation is high-context or low-context (Figure 8 below).

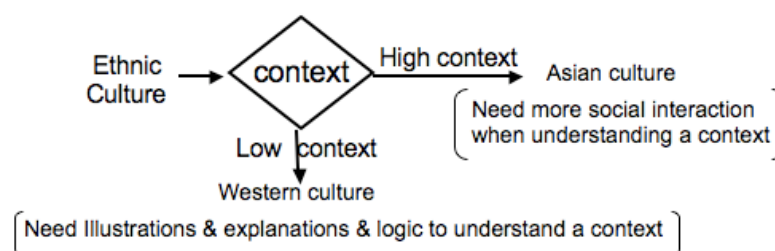


Figure 8. E-Governance Culture model

Context relates to the framework, background, and surrounding circumstances in which an event takes place (Hall, 1976). In a high-context culture, an explicit message takes a deeper meaning when correlated with the surrounding stimuli. Thus, high-context (HC) cultures (including much of the Middle East, Asia, Africa, and South America) are relational, collectivist, intuitive, and contemplative. This means that people in these cultures emphasize interpersonal relationships. In a low-context culture an explicit message by itself provides the meaning without any dependency on its surrounding context. Thus, low-context (LC) cultures (including North American and much of Western European) are logical, linear, individualistic, and action-oriented (Figure 8 above). Thus, people from low-context cultures value logic, facts, and directness.

The proposed E-governance Implementation Model of Figure 10 below thus takes a systemic view of the e-governance environment that recognizes online responses of cognition, emotion, and motivation as constitutive elements of culture (Kitayama, 2002). Recently, many cross-cultural differences have been uncovered through efforts to capture on-line responses (Fiske, *et al.*, 1998). Therefore, the computer-mediated e-governance between the organizations of a high or low context culture, with that of citizens (G2C) with similar high or low context culture takes on critical importance.

In the e-Governance Culture Model (Figure 8 above), we present two broad types of cultural perspectives based on HC and LC: the Asian culture (HC) would thus be somewhat antithetical to the American/Western culture (LC). This is supported by recent literature that views such an East-West dichotomy in terms of several dimensions including self-evaluation, emotional experience, social cognition and cognitive dissonance (Kitayama, *et al.*, 2003;

Fiske, *et al.*, 1998; Markus & Kitayama, 1991). The behaviors and perceptions of people in collectivist cultures (such as the Asian) are different from those of people in individualist cultures (such as the American) [Triandis, 1995]. Individuals from a Western (low context) culture are oriented to goal achieving while being short-term oriented, whereas individuals of an Eastern (high context) culture are long-term oriented (Hall & Hall, 1990).

This East-West difference can be seen in websites designed by people of high or low context as being significantly different from each other in style and content (Würtz, 2005). A low-context culture leads to crisp web layouts with clean functional designs for quick goal achievement, showing that these individuals are short-term oriented. It also takes a monochromic perspective of time with low use of images, banners, and flash features. A high-context culture supports a friendly relationship with customers using imagery. Since modern e-government thrives on an Internet platform supported by various forms of communication with outside constituents, a website design by a high-context (HC) individual will utilize a high degree of animation.

These images promote value through a collective group sense and achievement, while an individualistic society in a low context (LC) culture would employ a more rational and predictable approach to web design. This applies reciprocally to end-users also—a HC citizen will gravitate towards an e-governance website that is designed by a designer from a HC culture; and, a citizen with LC orientation will prefer to interface with LC communicators. The practical implication of the transcultural aspects of e-governance is that the proposed E-Governance Culture Model needs to provide both HC and LC content separately in order to successfully communicate to both HC and LC audiences.

## E-GOVERNANCE TECHNOLOGY ACCEPTANCE MODE

Mazhar (2006) proposes Technology Acceptance Model (TAM) - figure 9 below is an information systems theory used to measure how users come to accept and use technology.

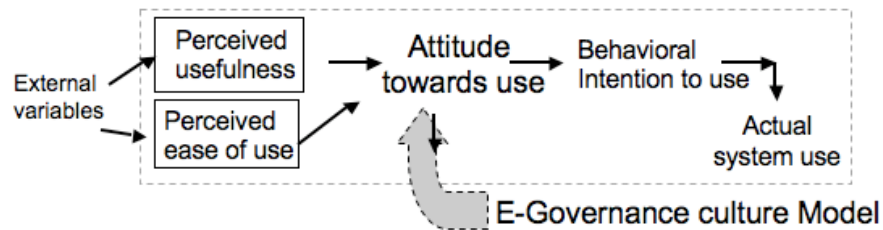


Figure 9. Technology Acceptance Model (TAM).

Adapted from: Mazhar (2006)

When a user acquaints with technology, two factors influence their decision to use or not to use what they see. The first factor is perceived usefulness (PU). This is the degree to which a user believes the technology will enhance their job performance. The second factor is perceived ease-of-use (PEOU). This is the degree to which a user believes that this technology would provide freedom from needless effort. If a user perceives technology to be a positive factor, then a positive performance bonds the user to technology. TAM is also a study of attitude. A user's attitude is positive if usability is seen to be easy. According to Shachak & Fine (2008), hands-on training and surveying (pre-requisite checklist of E-Governance implementation model) help in forming realistic perceptions.

## E-GOVERNANCE IMPLEMENTATION MODEL



## **E-GOVERNANCE AND THE HEALTHCARE INDUSTRY**

In accordance with the successful implementation model of e-governance we look at the healthcare industry to grasp the relevance of this model. As stated by Capper & Sands (2006), public health and pharmacy are very closely linked—hence impossible to separate. Pharmacists play an important role to enhance the conditions of public health. According to a survey done by Rice & Katz (2000), the public depends upon Internet for healthcare information, advice and support. Indeed, healthcare hosts a number of services, provided by e-government and e-governance.

Various case studies (in the healthcare industry environment) were researched to seek relevance of the derived E-governance Implementation Model - Figure 10. As Capper & Sands (2006) argue, public health provides services to society so as to enhance people's health condition. Kachnowski (2004) points out the importance of healthcare e-governance when the US government noticed its importance after the September 11, 2001, attacks over the New York twin towers, as the US government failed to manage its aftermath. Even though several initiatives have been taken at various levels, progress is still slow. A pharmaceutical company is a micro level healthcare provider whose interaction with e-government is G2B. E-government has become a vital provider of much-needed versatility and service to the healthcare industry. Research has also supported the demanding rise in pharmacy and electronic healthcare services typified by web-based hospitals.

A research was conducted on an online pharmacy ([www.DocMorris.com](http://www.DocMorris.com)) as a technology-based approach to the development of new services to restructure the German healthcare market. The German e-governance architecture set out cost-cutting initiatives by authorizing

online pharmacies. With E-commerce infrastructure in place for Germany, traditional pharmacies take on a more digital role of licensed electronic pharmacies. If a traditional pharmacy provided selling for medical services in person and occasional health advice sharing, now e-pharmacies share via email and deliver by mandated parcel post. In doing this, they keep customer satisfaction, customer privacy, and data security as their uppermost priority. German e-governance healthcare agency serves actors such as health insurance funds, medical professionals, and hospitals. The central government sets up the legislature framework for service provisions. The Federal Bureau for Medical Products agency manages drugs and electro-medical products. On the bases of this research, the above pharmacy was assessed as a business model. In conclusion, this online business was able to offer multiple distribution channels with enhanced service quality and an improvement for the German health care services.

According to Ray & Mukherjee (2007) who suggest an e-governance framework utilizable for health care projects for India (and other developing countries), an e-governance initiative is based on a value chain that begins from data that can be processed to information, which in turn can be processed to knowledge—which can be processed further into action. The Governance model has services such as G2C, G2A and G2B. In G2C, citizens search for information such as a list of medical practitioners; (2) In G2A (as for G2E) departments are interlinked within a government. In G2B effective supply chain management provides better doctors in healthcare.

Parties involved in healthcare e-governance are government, health centres, medical colleges, medical suppliers, citizens, etc. Any e-governance initiative should cater to the value chain and provide citizens in rural areas information, education, training and support to a positive

attitude and users' optimal behavior. E-governance initiative should establish an upward flow of clinical information from citizens (bottom) to policy makers and practitioners (top) so the people at the top are able to adhere to citizens' needs as well as set up healthcare databases.

Ray & Mukherjee (2007), stress that the emphasis should be on e-governance, rather than on computerization. Instead of focusing on technology and infrastructure, the accent should be on satisfying citizens and businesses. Keeping this in mind, ICT now includes use of cellular phones, PCs, Internet, Satellite communications, kiosks, PDAs and telephones used to providing access to rural and urban areas. Citizens, who comprise the elderly, youth, men, women, the disabled and ethnic minorities, must have access—using ICT, education, income, appropriate content and information.

As illustrated in Figure 1 (E-governance Model), G2C, G2B and G2A initiatives in healthcare focus on spreading information in the first (information) phase. The second (interaction) phase is an offline stage where agencies, citizens and businesses get to interact with the government through email, discussion forums and online forums. When this stage is online, real information exchange takes place between departments where digital signatures or e-contracts can be introduced. The transaction phase—also called integration phase—is a mature phase that joins (through legislation, process and technology) G2C, G2B and G2A. The last (transformation) phase is an advanced phase where G2C gets knowledge repositories and search engines to look up past disease cases and information. Here G2A performs decision support and analysis as well as forecasting. At this phase, G2B demands forecasting and rate vendors for time, quality and cost.

From the technology perspective, the E-governance Architecture Model illustrated in Figure 5 above is well supported with a conceptual architecture of similar purpose. In this figure these are numbered from 1 to 4. From a conceptual perspective this model caters to healthcare from the following angles:

- 1 **User Community:** (1) G2C: General user, (2) G2A: Hospitals or private nursing homes, and, (3) G2B: medical equipments manufacturers or infrastructure suppliers.
- 2 **Data communication on devices:** kiosk or mobile device
- 3 **Data communication applications:** services utilized in healthcare when supporting 4 phases of e-Governance Model - Figure 1.
- 4 **Processing:** services to manage user registration and user authentication

A case study-based research was conducted by Nawakda, Fathi, Ribiere & Mohammed (2008) on a knowledge management initiative begun in 2001 in the Ministry of Health of Bahrain. The sharing and managing of knowledge was becoming important at all levels of the Ministry. In this governmental department, knowledge is primarily focused on patients (x-rays, lab tests and treatment costs). In support of the E-governance Infrastructure Model in Figure 4, the Ministry of Health implemented knowledge management so that explicit knowledge can be shared as e-services through the e-governmental portal in Bahrain.

According to Killen, Hunt, & Keinschmid (2008) knowledge is classified as explicit and tacit knowledge. Explicit knowledge or tangible knowledge is information expressible in daily languages, published in documentation, and expressible amongst individuals. Tacit knowledge is embedded within an individual's experiences, beliefs, perspectives, values and

instincts and is mostly inexpressible.

## **CONCLUSION**

E-Government is an infrastructure with sub-categories such as i-government, g-government and m-government. ICT-enabled e-government strengthens activities and services via non-commercial models for e-government. As per a 2008 UN survey, 160 countries have begun an e-government initiative. Each initiative is considered unique to the context of the country's government. E-governance is a wider concept, making e-government a subset of e-governance. E-governance is an IT-driven management system providing services to its users. In this paper, nine models are integrated to formulate an E-governance Implementation Model - Figure 10 that holds future theoretical and practical implications for research to further development and refinement. These nine models are: (1) E-governance Model - Figure 1, (2) E-governance Construction Model - Figure 2, (3) E-governance Framework Model - Figure 3, (4) E-governance Infrastructure Model - Figure 4, (5) Healthcare Knowledge Management Model - Figure 5, (6) E-governance Architecture Model - Figure 6, (7) E-governance Initiative for Web-services - Figure 7, (8) E-governance Culture Model - Figure 8 and (9) E-governance Technology Acceptance Model - Figure 9.

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