

A Comparative Analysis of Strategies for eGovernment in Developing Countries²

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Abstract

The adoption of e-government and effective use of Information and Communication Technologies (ICT) has the potential to yield significant benefits in the developing countries. This study investigates strategies to advance the use of ICT in the public sector in developing countries, with the aim of improving services and outcomes for government and citizens. A multi-level framework for analysis was developed. A meta-analysis of data gathered in a United Nations study of e-government readiness was performed, focussing on the developing countries that have greatly improved their relative positions recently. In general, the findings support the multi-level approach. At the national level, a low level of economic development, poor infrastructure and political unrest are inhibitors of public sector ICT progress. At a base level, access by individuals and organizations to ICT tools and IT-related education is necessary for e-government to be feasible. Some strategies were observed to be linked to progress with e-government across a number of developing countries, including leadership vision and willingness to initiate change within the government sector, an incremental, step-by-step approach to development, and sensitivity to local and cultural needs.

Keywords

Least Developed Country (LDC), ICT adoption, Public Sector, e-government, ICT Strategy

Introduction

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The importance of Information and Communication Technologies (ICT) in developing countries is increasingly being recognized in academic literature although as yet no clear and comprehensive framework or theory has emerged for dealing with the very complex issues involved. Kelegai and Middleton (2004, p.114) concludes that *IS (Information*

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Systems) research in this area has been non cumulative and fragmented, lacking an overarching framework regarding the context in which effectiveness criteria are applied'. Heeks (2002, p.102) states that 'until very recently, the entire literature on IS and developing countries would struggle to fill a single bookshelf'. Empirical research studies are few and scattered, although a number of international bodies and organizations including the United Nations Development Program (Accenture, Markle-Foundation and UNDP 2001; ASPA and UNDPEA 2001), International Telecommunication Union (ITU 2002) and the World Bank (2002, 2005) have carried out comprehensive investigations of ICT in developing countries.

The current study focuses on the use of ICT in the public sector in Least Developed Countries (LDCs). The public sector plays a leading role in ICT adoption and use in LDCs, being the largest user of computers and thus is able to exert considerable influence on the diffusion of ICT throughout the country through its policies and regulations (Flamm 1987; Nidumolu, Goodman, Vogel and Danowitz 1996). Adoption and implementation of ICT in public sector government agencies can pave the way for ICT diffusion in the country as a whole. The spheres of influence for public sector organizations using ICT include (i) improving government processes (*e-Administration*); (ii) connecting citizens (*e-Services*); and (iii) building external interactions (*e-Society*). Taken as a whole these activities can be referred to as *e-government* (Heeks 2004).

The lead author was personally motivated to undertake this research by his own experience working with ICT in the government sector in Bangladesh. It was observed that ministerial departments felt unable to take full advantage of ICT to increase efficiency or improve citizen access to government. The gap between government and citizen was increasing, allowing bureaucracy, lack of transparency and potentially corruption. The use of legacy systems meant that having to queue for hours to collect a government form was still a common occurrence. A need for further knowledge and strategic direction was strongly felt within the government sector.

Against this background, the aim of the current study was to investigate strategies to advance the use of ICT in the public sector in LDCs, with a view to constituting a framework and guidelines for other developing countries to improve services and outcomes for government and its citizens. The successful strategies and best practices followed by those countries could provide important lessons for other LDCs and also a focus for further research.

The paper proceeds as follows. Relevant prior research is reviewed to give a framework for the study. The meta-analysis of changes in e-government readiness across a number of LDCs is then described and conclusions drawn as to the strategies that are proving effective for use of ICT in the public sector.

Conceptual Background

The theories drawn upon for studying globalization, the Digital Divide and e-government are diverse and no single theoretical approach has yet found favour (Walsham and Sahay 2006). Theories used include the Theory of Reasoned Actions (TRA) (Fishbein and Ajzen 1980), the Technology Acceptance Model (TAM) (Davis, Bagozzi and Warshaw 1989) and Diffusion of Innovations Theory (DoI) (Rogers 1995). Other theorists drawn upon include Castells (1996, 2000; Castells 2000) perspectives on globalization, theory relating to information infrastructure (Rolland and Monteiro 2002) and broad meta-theoretical perspectives such as structuration theory (Giddens 1984) and actor-network theory (Latour 1991).

Problems have been noted with a number of the theories used. One problem is that they have been developed and tested primarily in the context of developed or western countries and are possibly not relevant in the context of many developing countries and LDCs. The Diffusion of Innovations theory grew out of the diffusion of farm innovations in developing countries (Rogers 1995, p.59). Rose and Straub (1998, p.40) note that: 'Of the 70 IT-based studies which either confirmed or extended the DOI model surveyed, none were conducted within developing nations'. Straub and his associates carried out a series of investigation in Arab countries using TAM and initially found it was applicable (Rose and

Straub 1998). Further studies, however, pointed out that a culture-influence modelling approach was needed to understand the effect of cultural beliefs by examining them individually in their respective cultural contexts (Straub, Loch and Hill 2003). A second problem is that the unit of analysis in many studies is not clearly specified and the complexities of the interrelationships among differing units of analysis are not well understood. Studies have taken as their focal units the individuals in a country, particular projects or organizations, or the country as a whole.

In light of the paucity of theoretical guidance in the extant literature, this study adopts a grounded approach (Glaser and Strauss 1967) within a contextual framework derived from the literature. A framework is used that provides a means of handling the complexity of the interactions between citizens, organizations, the government and other industry sectors, and the national and international context. It also allows for the reflexivity of these interactions. Although our study focuses on government use of ICT, it is necessary to consider the government sector in interaction with entities and structures at other levels, which will both constrain and enable the actions a government can take. Figure.1 depicts the multi-layered approach to the problem, envisaged as something like the successive layers of an onion. At each level the actions of entities within that level are both constrained and enabled by the structures of the levels above them, and in turn, through their actions, affect the structures that are in their immediate environment through cycles of reciprocal change.

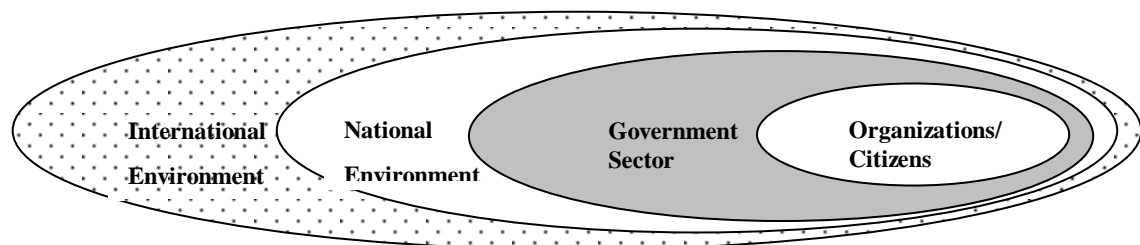


Figure 1: A multi-level approach to the use of ICT

Table.1 shows a summary of the influences at these different levels of analysis that have been implicated in ICT adoption and use in developing countries in prior studies.

Table 1: Multi-level influences on ICT adoption in developing countries

| Level | Influences on ICT related activities | Countries studied | Influences and studies |
|----------------------|--------------------------------------|--|--|
| International | International agencies | India | Promotion of Information Technology (IT) through domestic and foreign investment should be the first area of policy (Nair and Prasad 2002) |
| National | Economy | World | Lack of an economic environment conducive to investment is a problem (Rodriguez and Wilson 2000) |
| | | Nigeria | Political economy is the main differential between DCs and LDCs, not culture (Korpela 1996) |
| | World | Need a climate of civil liberties conducive to research and expansion of communication (Rodriguez and Wilson 2000) | |
| | Asia | Authoritarian regimes shape diffusion of ICTs to their political advantage by exerting control and censorship (Kalathil and Boas 2001) | |
| | Malaysia | Political stability is an important factor (Raman and Yap 1996) | |
| | Bangladesh | Political will from the top is very important (Sobhan, Shafiullah.M, Hossan and Chowdhury 2004) | |

| | | | |
|----------------------------|--------------------------------------|---|---|
| | Culture | 5 Arab Countries | Socio conflicts occur because technologies are culturally biased in favour of developed countries (Hill, Loch, Straub and El-Sheshai 1998) |
| | | Arab | Culturally appropriate IT design can enhance transfer (Straub, Loch et al. 2003) |
| | | Jamaica and Tanzania | Socio-cultural aspects can be highly influential (Hagenaars 2003) |
| | Infrastructure | Many countries | Lack of infrastructure is a primary problem. Asian countries lag non-Asian countries (Wong 2002; Wresch 2003; UN 2004) |
| | ICT policy/ strategy | Nepal | Government needs to provide a lead (Pradhan 2002) |
| | | Pakistan | Development policy and economic aspirations have strong linkages between direct ICT interventions (Mujahid 2002) |
| | | Malaysia | Step-by-step approach could be a model for countries with agricultural and natural resources (Raman and Yap 1996) |
| | | World | Policies need to be: (i) long term; (ii) aimed at building capabilities; (iii) adaptive to changing context; and (iv) synergistic with other ongoing national programs (Checchi, Hsieh and Straub 2003) |
| | | LDCs | Avoid over ambitious top-down approaches and stress virtues of multi-stakeholder involvement (Accenture, Markle-Foundation et al. 2001) |
| | Many | Need to facilitate local cultural content (UN 2004) | |
| Government sector | Administrative practice/ reform | Sudan | Lack of systematic principle and procedures in the system is a hindrance, embodying working procedures, managerial style and HRM policy (Higgo 2003) |
| | | Asia | There is a close relationship between e-government and administrative reform (Ahlert 2001) |
| | | World | The administrative reform process must be continuous (OECD 2003) |
| | Bureaucracy | Developing Country | Bureaucratic establishments pose insurmountable obstacles for introducing and sustained use of IT (Avgerou 1990) |
| | e-government strategy | World | Government needs to take the lead in establishing, reforming and regulating (UN 2004) |
| | Government regulation | LDCs | Necessary, since social counter pressures are unable to soften the impact (Filho, Padua and Luna 1982) |
| | Knowledge of ICT | Bangladesh | Need awareness and knowledge of ICT among government officials (Sobhan, Shafiullah.M et al. 2004; Taifur 2004) |
| Organizational | Top management support | Indonesia | Most important factor for successful development of IS (Kandelin, Lin and Muntoro 1998) |
| | | Malaysia | Support from top management is a success factor (Zaitun, Mashkuri and Wood-Harper 2000) |
| | | Bangladesh | Initiative from top level officials is crucial (Taifur 2004) |
| | Management knowledge of ICT | Papua New Guinea | Lack of understanding of ICT amongst top management is a drawback (Kelegai and Middleton 2004) |
| | Organizational culture/ values | Kuwait | IS managers in different countries focus on different management areas based on local conditions (Alshawaf and Delone 2002) |
| | | Egypt | Understanding existing organizational culture has a direct and positive impact (Serour and Henderson-Sellers 2002) |
| | Institutional development / capacity | LDCs | Institutional development is more important than 'bridging the digital divide' (Daly 2004) |
| Individual citizens | Penetration of IT Technology tools | All | A core set of basic tools (personal computers, mobile/handheld devices, hybrid devices) must be affordable to the majority of the population (UN 2004) |

| | | | |
|--|-----------|------|--|
| | | LDCs | Develop innovative behaviour in the societies to achieve pervasive ICT adoption (Corea 2000) |
| | Education | All | Education related to technology is needed (Rice 2003; UN 2004) |

Of particular interest for this study are the strategies and approaches different developing countries are using to promote more effective use of ICT in the government sector (e-government). The strategies implicated in prior studies include reform of administrative procedures, lessening of bureaucracy and increased knowledge of ICT within government agencies. The government sector is also expected to take a leadership role in promoting ICT and in building a regulatory regime and organisational environment that allows ICT use to flourish. The public sector can promote ICT use indirectly through its influence over the enabling conditions at other levels in our analytical framework, including encouragement of foreign investment, multinational involvement and ICT educational programs. Network effects, however, mean that the citizens and organizations in a country must be in state of readiness to use ICT before they can take full advantage of public sector initiatives to provide government services electronically.

The ICT uptake by the government sector internally (G2G), which is our focus of study, is a precondition for the ultimate success of e-government, where connecting citizens to government system is the major objective. To reach that stage, governments need to develop their own structures and mature systems with intra- and inter-agency IS implementations.

Methodology

Prior academic research studies of ICT use in LDCs have tended towards in-depth case studies of single countries (Walsham and Sahay, 2005). While this approach gives valuable insights into particular projects and initiatives, it does not give cross-country comparisons. In this study we have performed a meta-analysis of the data available in the *United Nations Global e-Government Readiness Report* (UN 2004; 2005), which gives data on the 191 member states for 2003, 2004 and 2005. In these yearly reports each member state is given an *e-Government readiness index* based on a weighted average composite figure calculated from (1) website assessment, (2) telecommunications infrastructure and (3) human resource endowment. The index is a 'measurement of the capacity and willingness of countries to use government for ICT-led development' (UN, 2004, p. 13) and incorporates accessibility issues like infrastructure and educational levels to judge the preparedness of a country in using ICT for national, economic, social and cultural empowerment of its people.

Our interest is in assessing what government strategies have been associated with a greater use of ICT for e-government in developing countries. One indication of the advance in e-government in a country can be found by comparing the rankings of a country from one year to the next (eg. from 2003 to 2004) and examining the strategies employed in those countries that have exhibited the largest jumps from one rank to a higher rank. Countries are ranked relative to each other, so a position of number 10, means that a country is the 10th ranked country of the 191 studied. The fact that a country drops in rankings from one year to the next, however, does not necessarily mean that its own e-government rating has decreased - rather other countries may have advanced comparatively more in the same time frame and overtaken them.

As prior work has shown that there are dramatic differences in ICT adoption between developed and developing countries, we have focussed our analysis on the developing countries, drawing data from 2003, 2004 and 2005 UN reports. We focussed on the developing countries which had the greatest relative change upwards ($\Rightarrow 10$) in their readiness index from 2003-2004. Further analysis of qualitative data in this UN report allowed identification of trends and patterns across the more successful countries. An analysis of 2004-2005 changes was also performed, although the 2005 report had less detail on the strategies used by each country .

Effective Strategies for the Public sector in Developing Countries

The UN global e-government readiness report gives data for all the 191 member states. The e-readiness index in 2005 shows the leading countries as the United States, Denmark, the United Kingdom and Sweden. Compared with 2004, the top 25 positions were occupied by the same set of developed countries with just a minor reshuffling of ranks among them. The top countries and their indexes were United States (.9062), Denmark (.9058) and Sweden (.8983). The average index across all 191 countries was (.4267). Widespread disparity among countries and regions was observed. The regions of Africa (.2642) and South and Central Asia (.3448) were far behind the rest of the world in almost all aspects of ICT development for e-government access.

Strategies and Comments for the years 2003-2004

Table 2 shows those developing countries that rose most markedly between 2003 and 2004, with a change in ranking of +10 or greater and highlights the main strategies they used. The 10 countries that were ranked lowest in 2004 were Chad, Ethiopia, Afghanistan, Mali, Niger, Timor-Leste, Micronesia, Marshall Islands, Palau and Nauru. The index figures of 2005 for developing countries with greatest advance shows in absolute terms that the majority at least maintained the level they had reached in 2004. Figure 2 presents the readiness indices for these countries from 2003-2005 graphically.

Table 2. Developing countries with the greatest advance in e-government readiness rank 2003-2004

| Country | Region | Index 2004 | Rank 2004 | Rank 2003 | Change | Characteristics of strategies employed |
|--------------|-------------------|------------|-----------|------------|--------|--|
| Uzbekistan | S/Central Asia | .3965 | 81 | Not ranked | >173 | Effort to avoid language barriers with multi-language sites. |
| Kyrgyzstan | Central Asia | .4468 | 66 | 110 | +44 | Provision of e-services according to indigenous priorities development plans. |
| Venezuela | S America | .4898 | 56 | 93 | +37 | A strong commitment to education, online services, interactive features, poll and open discussion forums. |
| Mongolia | E Asia | .4152 | 75 | 103 | +28 | Priorities and political willingness allowed 'leapfrogging' to higher stages and bypassing of intermediate stages. |
| Saudi Arabia | W Asia | .3858 | 90 | 105 | +15 | Expansion and improvement of overall sectoral presence online. |
| Pakistan | S/Central Asia | .3042 | 122 | 137 | +15 | A simple and illustrative model of steady incremental development |
| Kazakhstan | S/Central Asia | .4813 | 69 | 83 | +14 | Heavy investment in designing e-strategies and programs with an outreach message. |
| Columbia | S/Central America | .5335 | 44 | 57 | +13 | A much improved one stop-shop e-government portal. |
| Barbados | Caribbean | .4563 | 65 | 76 | +11 | Commitment to e-services online even with limited resources. |
| Honduras | S/Central America | .3301 | 113 | 124 | +11 | Impressive education sector services and discussion forums. |
| Botswana | Africa | .3827 | 91 | 101 | +10 | Proves incremental implementation can be highly successful if done professionally and strategically. |

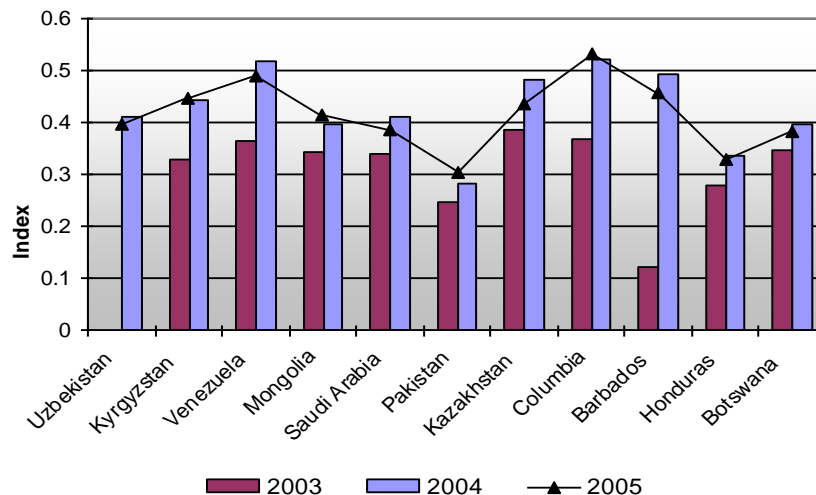


Figure 2: eGovernment readiness indices for developing countries that improved their ranking from 2003-2004

The results of this survey overall support the multi-layered model presented in Figure 1. The obvious effects of factors at the national level that affect uptake of ICT in government include the political situation and the economic situation. Governments in high-income countries were well advanced in terms of their provision of public information, online services, and electronic access to government. The bottom 40 countries had made relatively little progress between 2003 and 2004. The UN report comments on the problems with the countries of South and Central Asia:

Despite progress, the lack of infrastructure and education is the most serious barrier to further expansion of e-government. The enabling environment in many countries in the region is characterized by irregular or non-existent electricity supplies, especially outside large cities, telephones remain luxury items and internet access is available to only the privileged few in the upper income bracket. South and Central Asia is home to about 25 percent of the world's population but has a GDP (Gross Domestic Product) per capita equal to 10 percent of the world average and 1.6 percent of the United States (UN 2004, p. 43).

The interrelationships among the levels is also obvious, with countries that make an advance in e-government also showing a rise in factors operating at the level of individuals and organizations, such as the degree of penetration of technology tools and ICT literacy.

Factors associated with advancement from 2003-2004

It is instructive to consider some of the strategies employed in those developing countries with a significant improvement in more detail. Although these countries have the problem of using technologies that were designed in developed countries with differing cultures, yet they have managed some success.

Uzbekistan showed the greatest rise, going from no government online presence to 81st in the world. The progress made in Uzbekistan is a response to the growing number of Internet users in the country, which has doubled in the recent past. Approximately 73% of users are in the capital of Tashkent and rely on Internet cafes for access. The government has attempted to ameliorate language barriers by providing content in native Uzbek, Russian and English. Even though the government web site provides only limited information, it encourages feedback with a web content form and clear and accessible information. The UN report sees Uzbekistan as a good illustration of what a country can accomplish with e-government with even a modest level of resources and planning effort.

Kyrgyzstan, a relatively new independent state with low economic status, made a breakthrough within a year to rise 44 places in the global rankings. Kyrgyzstan provides an example of the provision of government services focussing on indigenous priorities and development plans.

Mongolia made the greatest advance among the countries in South and Eastern Asia, jumping 28 places from 103 to 75. It provides an interesting example:

Mongolia's e-government efforts prove that stages of e-government need not be additive. Depending on their priorities and the political willingness, countries can 'leapfrog' to higher more mature stages of service delivery even bypassing transactional stages which require, among other things, sophistication of financial systems... Unlike most other countries, the Mongolian site has advanced into the networked presence without the typical incremental coverage of all the basics. The e-participation mechanism includes an online legislative and online policy forum. Both are frequently used and appear to be very popular (UN 2004, p. 33).

However, although some Central and South East Asian countries demonstrated best practices and steady progress, other countries located in the same region were lagging and falling further behind: For example, Indonesia (-15), Philippines (-14), and Vietnam (-15). Some countries in this region showed no change, including Nepal, Bangladesh, Bhutan, Myanmar, and Laos.

Strategies and Comments for the years 2004-2005

A similar analysis was also carried out with 2005 report taking the countries which had jumped 10 or more positions in 2005. Table 3 lists those developing countries that advanced their ranking in 2005. But this time a completely new set of countries was found, including many that were significantly lagging in 2003-2004. This finding is likely in part a function of the fact that ranking data is used, so that a country that is relatively low ranked in one year has a much greater chance of improving its relative position in the following year.

Table 3. Developing countries with the greatest advance in e-government readiness rank (2004-2005)

| Country | Region | Index 2005 | Rank 2005 | Rank 2004 | Rank 2003 | Change 2003-04 | Change 2004-05 |
|----------------------------------|-----------|------------|-----------|-----------|-----------|----------------|----------------|
| Egypt | Africa | .3793 | 99 | 136 | 140 | +4 | +37 |
| Bhutan | S Asia | .2941 | 130 | 165 | 161 | -4 | +35 |
| Saint Vincent and the Grenadines | Caribbean | .4001 | 88 | 119 | 111 | -8 | +31 |
| Timor-Leste | SE Asia | .2512 | 144 | 174 | 169 | -5 | +30 |
| Kuwait | W Asia | .4431 | 75 | 100 | 90 | -10 | +25 |
| UAE | W Asia | .5718 | 42 | 60 | 38 | -22 | +18 |
| Qatar | W Asia | .4895 | 62 | 80 | 77 | -3 | +18 |
| Islamic Republic of Iran | Asia | .3813 | 98 | 115 | 107 | -8 | +17 |
| Oman | W Asia | .3405 | 112 | 127 | 98 | -29 | +15 |
| Antigua and Barbuda | Caribbean | .4010 | 86 | 99 | 92 | -7 | +13 |
| Cyprus | W Asia | .5872 | 37 | 49 | 51 | +2 | +12 |
| Georgia | W Asia | .4034 | 83 | 94 | 99 | +5 | +11 |
| Guatemala | S America | .3777 | 100 | 111 | 109 | -2 | +11 |
| China | SE Asia | .5078 | 57 | 67 | 74 | +7 | +10 |
| Saudi Arabia | W Asia | .4105 | 80 | 90 | 105 | +15 | +10 |
| Zimbabwe | Africa | .3316 | 120 | 130 | 116 | -14 | +10 |
| Ghana | Africa | .2866 | 133 | 143 | -4 | -4 | +10 |

- *Shaded ones progressed in consecutive years*

Unfortunately, detailed characteristics and strategies behind each country's advance were not articulated clearly in the 2005 report. However, some strategies similar to those observed in the 2004 report were noted, including the development of national portals, an increase in online presence, new service delivery, steady improvement, more dedication and commitment, deregulation of telecommunications. In addition to political commitment, the 2005 UN report also identified 'a well thought out vision' and 'do-

able objectives' as important markers for a successful eGovernment development. There was good progress in Arab countries in 2005 tending to refute the previous notion of cultural barriers in technology adoption, especially in Arab countries (Hill, Loch et al. 1998; Straub, Loch et al. 2003).

Trends

Overall, our analysis identified a number of themes that were common in a number of the LDCs showing improved rankings compared with others. These themes were:

- (1) *Leadership and political willingness to initiate change within the government sector* was evident in the majority of countries with improved positions. Malaysia for example, has a Malaysian Administrative Modernization and Management Planning Unit (MAMPU) that seeks to enhance the use of ICTs and has mandated that each government agency create an IT strategy to help facilitate greater communication between agencies and the public.
- (2) *An incremental step-by-step approach to development* was also common across the majority of the LDCs with a step up in ranking. Examples include Pakistan (+15, 2004), Saudi Arabia (+15, 2004), China (+7, 2004, +10, 2005), Thailand (+6, 2004) and Kuwait (+25, 2005). There was limited evidence of top down long-range planning approaches that had noticeable effects (possibly because of the generally low level of maturity in ICT planning and adoption).
- (3) *'Leap frogging' is possible*. It is not necessary to go through steps or stages in a fixed sequence. Mongolia is an illustration, advancing considerably although it bypassed a transactional stage.
- (4) *Sensitivity to local and cultural needs in the development of web sites* was evident in countries including Uzbekistan (>173, 2004) and Kyrgyzstan (+44, 2004), Egypt (+37, 2005).

Overall, the finding from this analysis are congruent with the framework established from prior studies, with all three of these themes having been identified in prior work (Table 1), the exception being the 'leapfrogging' effect. In contrast, administrative reform was identified by Higgs (2003) as a hindrance to advancement, but was not emphasized in the UN report. The analysis and trends in different years further reveals that success in eGovernment in LDCs does not necessarily involve a long term planning process. Rather, good intentions coupled with political will and effective drive can change a country's status. This observation reinforces the findings and recommendation in other literature concerning the importance of leaders with a clear vision who champion ICT in developing countries.

Conclusion

The aim of this study was to investigate strategies to advance the use of ICT in the public sector in developing countries so as to improve the services and outcomes for government and citizens. A conceptual framework for the study was developed from prior literature with a multi-level analysis, depicting influences on the ability of the government sector to engage in e-government at the international and national levels and reciprocal relationships with the preparedness at the organizational and individual level in terms of the penetration of IT tools and appropriate education.

A meta-analysis of data gathered from a UN study of e-government readiness was performed, focussing on the developing countries that had exhibited the greatest change in their ranking from 2003 to 2004 and then 2004 to 2005. Patterns that typified the successful countries in comparison with their less successful counterparts were extracted by studying the qualitative data in the report. In general, the findings support the multi-level framework that was suggested by prior literature. At the national level, a low level of economic development, poor infrastructure and political unrest are inhibitors of public sector ICT progress. At the lowest level, individuals require access to ICT tools and IT-related education to set up the conditions under which e-government is feasible. The only level where there was no data to support expected relationships was at the international level, where none of the case studies mentioned international investment or multi-national firms. Possibly these factors are less evident when studying government sector advances, rather than the private sector.

However, even amongst the LDCs, which all suffer to some extent from an environment inimical to e-government growth, some strategies appear to lead to success: leadership and willingness to initiate change within the government sector, an incremental, step-by-step approach to development, and some sensitivity to local and cultural needs in the development of web sites. Our results suggest some strategies can be used with success in more than one country. These strategies provide a general direction that can guide actions to be adapted by respective governments. However, one has to be cautious, as some studies reinforce the idea that the environment of each LDC is unique (Montealegre 1999) and that there is no 'one size fits all' approach (Accenture, Markle-Foundation et al. 2001).

There are a number of limitations to this study. For empirical evidence it has relied on secondary sources, with a meta-analysis of data in a worldwide UN study. Although the UN study was comprehensive and rigorous, its purpose was not the same as ours and so the data we could glean is necessarily limited. The absence of evidence for relationships may be because relevant data was not collected, not because the relationship does not exist. Further, the use of the change in eReadiness ranking as a sign of progress is indicative rather than a firm measure. As the majority of the developing countries are at very low levels of eReadiness, even modest development in e-government can result in a dramatic change in ranking. However, the lack of prior academic research on a world-wide scale means that our approach has some justification.

The study is a preliminary one, and further work is anticipated using the framework developed here as a base, with on-the-ground case studies of LDCs. The study is significant in that it contrasts findings from a large scale study with a framework of influences derived from a scattered literature. It brings together literature from both academic resources and reports funded by international agencies to give a good base for understanding the complex phenomenon involved.

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