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THE FAILURE OF E-GOVERNMENT IN DEVELOPING COUNTRIES: A LITERATURE REVIEW

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ABSTRACT

This paper provides an insight to the trends that exist within academic writing in the much talked about area of e-government, and the potential they hold for developing countries. While there is much hype about success stories, the bitter truth that presents itself is that the majority of e-government projects in developing countries fail. After an introduction to Ciborra's (2005) view on e-government, this paper proceeds to use Heeks' (2003) 'archetypes of failure', which are brought about by gaps between the design of the technology itself and reality of the context, to classify some of the current literature. This classification provides a brief overview of themes manifested within this body of knowledge, serving as a useful background for practitioners and implementers of e-government in developing countries.

1. INTRODUCTION

Electronic government (e-government) is often heralded as the new way forward for the public sector in both developed and developing countries. There are several examples of how this form of government leads to increased rates of development and allows for greater democracy, and how it can be successfully implemented in developing countries (e.g. Krishna and Walsham, 2005; Bhatnagar, 2002). In contrast to this line of argument, the purpose of this literature review is to provide an outline of the reasons that e-government often fails in developing countries. Given the focus of this article, the criticism of the implementation of e-government in developing countries as well as the identification of a set of solutions to common problems in this field is beyond the author's current scope. Instead, this paper will serve as a study of the literature on what often goes wrong within the context of e-government in developing countries, thereby allowing those in the field to use this knowledge to anticipate potential problems and create more robust and effective plans.

According to the World Bank website (2005), e-government can be defined as:

> "information technologies…that have the ability to transform relations with citizens, businesses, and other arms of government…[and] can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management…benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions."

Given the afore mentioned definition, it is evident that e-government is not merely the computerisation of a government system, but a belief in the ability of technology to achieve high levels of improvement in various areas of government, thus transforming the nature of politics and the relations between governments and citizens.

2. E-GOVERNMENT IN DEVELOPING COUNTRIES: A RECIPE FOR FAILURE?

Although the notion of failure can vary significantly according to context, time and viewpoint, it is useful to loosely define what is meant by it. For the scope of this discussion, e-government failure is defined as the inability of such a system to achieve predefined goals or other, previously unanticipated benefits.

There are numerous articles available in information systems literature that deal with the failure of information systems (e.g., Lyytinen and Hirschheim, 1987; Horton and Lewis, 1991) and the failure of information systems in developing countries (Boon, 1992; Beeharry and Schneider, 1996). This paper tries to focus specifically on literature dealing with e-government in developing countries rather than the more general literature, although at times it has been appropriate to include such literature; for example when the authors have been involved with e-government in developing countries. Because the stipulated topic is part of a relatively new and emerging field, there is not much history within the academic literature, or any significant changes in thinking over time. Most of the citations in this paper are of literature that has been published during the last ten years. Differing perspectives and paradigm shifts are often the luxuries of phenomena that have been in existence for some time. Despite this, this paper aims to investigate the failure of e-government in developing countries using an eclectic mix of articles.

It is appropriate at this stage to establish why this literature review deals specifically with the failure of e-government in developing countries. Numerous studies have shown that it is not just e-government applications, but information systems in general that fail in developing countries. A literature review by Avgerou and Walsham (2000) in this field concludes by stating, "successful examples of computerisation can be found…but frustrating stories of systems which failed…are more frequent".

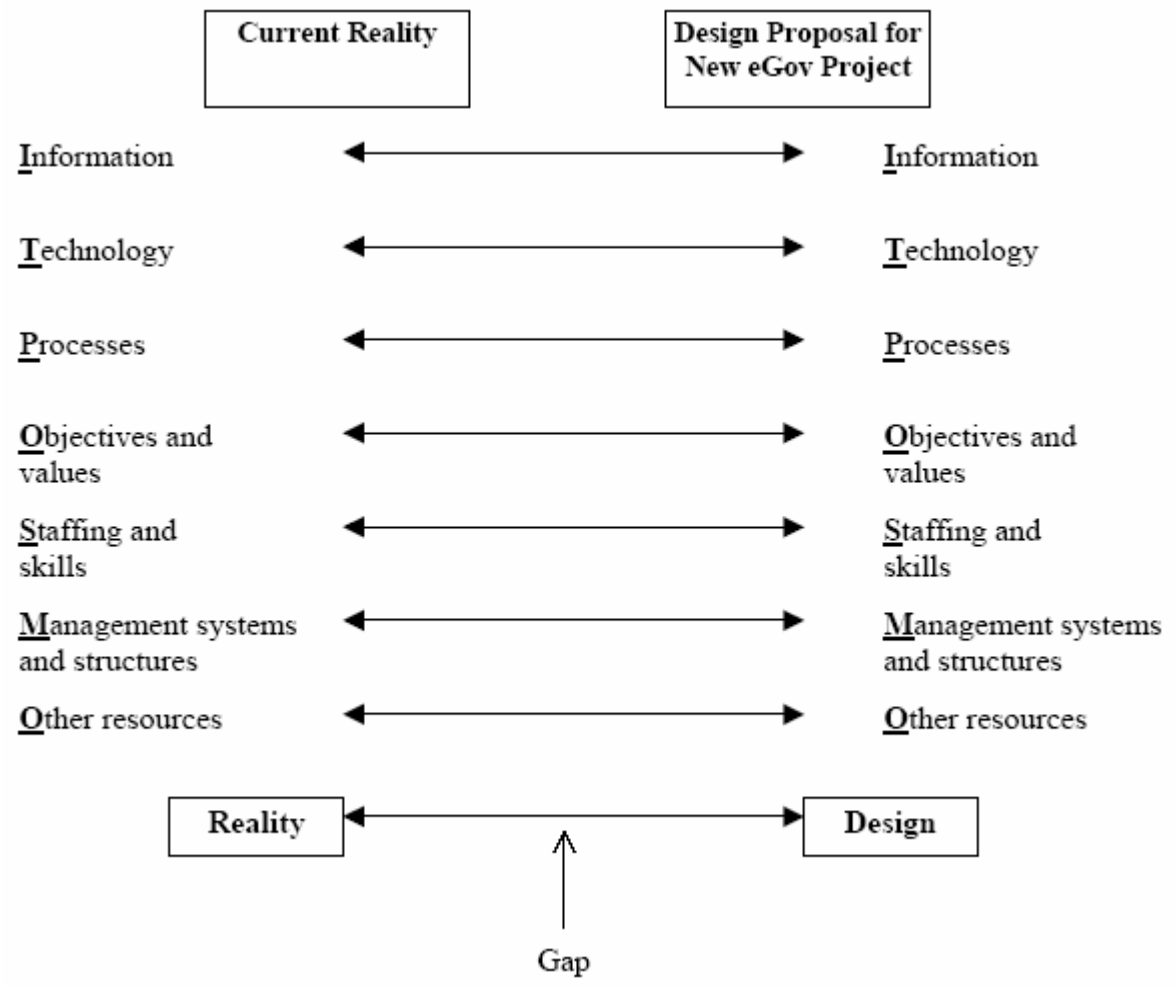
According to Heeks (2003) who has done substantial research in the subject area, most implementations of e-government in developing countries fail, with 35% being classified as total failures (e-government was not implemented or was implemented but immediately abandoned), and 50% as partial failures (major goals were not attained and/or there were undesirable outcomes). This is a disturbing fact, especially as developing countries have a limited number of resources at their disposal, and cannot afford to wastefully spend large amounts of money typical of such projects. As such, this article makes a contribution by the questioning the often unrealistic expectations often attached to e-government applications in developing countries.

Heidegger (1978), states that the essence of technology is not something technical, or a means to an end. Instead, the essence of technology is a *revealing* that challenges the world by ordering it and creating a concrete infrastructure. This infrastructure once again can be ordered to create another *revealing* and so can continue. Ciborra (2005) uses this framework when describing the use of e-government in developing countries; where the focus of technology is the ordering of the relationship between the administration and the citizen, in setting the boundaries between the state and the market, and in ensuring of greater accountability and transparency. He states that this is often the reason for developing countries to partake in e-government projects, as having such a system is believed to equate to models of 'good governance' and increased development, and hence affects the levels of aid that they receive from rich nations.

Using a subjective ontology, Ciborra (2005) suggests that this motive, so often cited as the reason for the adoption of e-government in developing countries, is highly questionable. Good governance is not always the outcome of e-government; bureaucratic or military

administrations will not automatically become more transparent, efficient and market-like as a result of it. Using a case study of e-government implementation in Jordon as a background, he speculates that developing countries may not be ready for such a system where citizens are seen as customers. This would mean that privileged segments of the population may have access to the services more easily, corruption can continue as favouritism and bribery are offered to new intermediaries, and levels of democracy and competition will not be affected. Thus, it can be deduced that Ciborra (2005) holds the view that that the notion of e-government on its own is not suited for developing countries to obtain the associated benefits; and that instead political and social changes are required alongside the implementation of electronic mediums. Alternatively, he indicates that an economy will be required to develop to a service delivery state or a minimal state (Kahn, 1997), where failures due to governance breakdown, corruption, rent seeking, distortions in markets and the absence of democracy are addressed before e-government can be implemented within it. Ciborra (2005) also articulates how e-government applications could be used as a *technology of control* by the West in order to implement a self regulating and monitored system of governance in 'weak states' that may otherwise pose a threat to international security.

Figure 1: Design-Reality Gaps in e-Governance Projects - from Heeks (2002; 2003)



Keeping Ciborra's (2005) views in mind as a background to the subject, we can consider a contrasting and more objective ontological approach to the failure of e-government in developing countries by examining research undertaken by Heeks (1998; 2002; 2003), which provides clear-cut situations that often result in failures. By examining numerous cases of IS and e-government failure in developing countries, Heeks (2002; 2003) states that a

major reason for these failures is the mismatch between the current reality and the design of the future e-government system. The chances of failure increase as the gap grows. Heeks (2002; 2003) uses the model in Figure 1 to illustrate this situation.

The problem that often arises with developing countries is that there is frequently a mismatch between the current and future systems, due to the large gap in the physical, cultural, economic, and various other contexts between the software designers and the place in which the system is being implemented (Heeks, 2002).

The model has led Heeks (2003) to identify archetypes of situations where design-reality gaps are common. These are summarised below:

- *Hard-Soft Gaps:* the difference between the actual technology (hard) and the reality of the social context (people, culture, politics etc.) in which the system operates (soft).
- *Private-Public Gaps:* the difference between the private and public sectors means that a system that works in one sector often does not work in the other, due to gaps between systems designed for the private sector and the reality of the public sector into which the system is transferred.
- *Country Context Gaps:* the gap that exists when trying to use the e-government systems for both developed and developing countries, which arises from the gap between a system designed for one country and the reality of a developing country into which the system is transferred.

It is this idea of gaps as conceptualised by Heeks (2002) that can be seen as a framework upon which almost all available literature on the failure of e-government in developing countries is based. Even Ciborra's (2005) view, where there is a gap between the political situation that is present and that which is required for successful e-government implementation, can be placed in Heeks' framework. Numerous areas of the literature discuss factors that lead to failure, and in order to create a meaningful classification, these will be organised according to Heeks' (2003) archetypes. Thus apart from outlining the reasons that so many e-government projects in developing countries fail, the contribution of this paper is to apply Heeks' conceptual model of classification to current e-government projects in developing countries using evidence from previously published literature.

2.1 Hard-Soft Gaps

Hard-Soft gaps are commonly cited in examples of e-government failure in developing countries. Soft, human issues that are not initially incorporated into the design of the e-government project of result in undesirable affects after implementation. Stanforth (2006) states that technology is just one of a number of heterogeneous socio-technical elements that must be considered and managed in the design and implementation of a successful information systems project. Similarly, an interpretive set of case studies concerning e-government projects in Kerala, India, have revealed that the numerous factors which allow individuals in developing countries to access the services effectively are ignored. These factors depend on resources, skill-levels, values, beliefs and motivations of those involved in the project (Madon, 2004). From this it can be inferred that a lack of training, skills and change management efforts (soft factors) would all affect the rates of failure, as they would create a wide gap between the technology itself and the context within which it exists.

Cecchini and Raina (2004) state that it is imperative for e-government projects to establish the service and information needs of the community that it is serving, and that the technology itself should be developed in collaboration with local staff. This would considerably decrease the Hard-Soft gap, and create a sense of local ownership. It is also

important to involve the people most closely related to the project by improving local awareness of the project through promotional campaigns. Cecchini and Raina (2004) go on to say that "the local administrative and political actors need to be involved in the implementation of the project, otherwise the likelihood of failure increases dramatically".

Jaeger and Thompson (2003) assert that an e-government system would fail if the government did not take an active role in educating citizens about the value of e-government. Although speaking from the context of a developed country, one can envisage how this situation could be aggravated in developing countries where more often than not, literacy rates are low and educational institutions are lacking. Odedra-Straub (2003) states that developing countries have severe limitations in terms of connectivity, and the underlying presence of user access required to partake in the basic processes of a market society. Thus we can infer that e-government would probably fail if the users did not have the ability to use the technology to enable access of useful information and services. This would lead to a low user base, as the system would not be equally accessible by all citizens.

Linked to this is the lack of skills and training which are required to effectively use an e-government system that is available to government officials and citizens. This problem has been referred to by numerous academics (e.g. Heeks, 1999; Moon, 2002; Ho, 2002). It is a particularly significant problem in developing countries due to the chronic lack of qualified staff and training schemes, which are necessary conditions for the existence of successful e-government schemes (Ndou, 2004). The same stance has been taken by Basu (2004) who states: "there are insufficient numbers of people in developing countries trained in appropriate technologies…training opportunities are also straining to meet needs". The low rates of literacy in developing countries make this situation very difficult and costly to change, thus accounting for why e-governments so often fail in these countries.

The issue of change also forms part of the Hard-Soft gap, as an e-government initiative constitutes the realignment of working practices and government functions. As already shown by literature from developed countries, the public sector must change and reengineer its processes to adapt to the new technology and culture of an e-government system. This can be problematic and can result in some stakeholders resorting to politics due to their reluctance to share information, which might be perceived as a reduction of their authority (Ebrahim and Irani, 2005). The case of developing countries seems far more difficult. In situations where corruption and rents are the norm, the realignment of information flows and the underlying power structures are heavily resisted by actors with vested interests (Peterson, 1998). If this and other forms of resistance are not managed using change management or similar initiatives (Ndou, 2004), the gap between the technology and the social context in which it operates cannot not be bridged.

Thus, in the context of developing countries, it seems that the problem can be said to lie with both the hard and the soft. The design does not take into consideration the soft, human issues of a particular context – and conversely the context does not have the training, skills or other related factors that are required to implement the system in question.

2.2 Private-Public gaps

Private-Public gaps is the next archetype defined by Heeks (2003), who uses the metaphor of square pegs and round holes to describe the situation of trying to fit an information system designed for the private sector into the public sector.

A common problem associated with the public sector is uncompetitive rates of pay as compared to the private sector. The prevalence of this situation impedes the recruitment of high quality IT professionals (Ciborra and Nevarra, 2005), which leads to a lack of public

sector skills. As a result e-government projects are often outsourced to the private sector, fuelling a clash of culture and values, as well as large gaps between the design and reality (Heeks, 2003).

E-government projects in developing countries are usually driven by individual government departments that frequently depend upon on aid from donors. Once this financing ceases, there is often insufficient funding to continue the project (Schware and Deane, 2003). Private sector IT investments rarely run out of funding, as money is usually allocated specifically for such investments. Individuals implementing an e-government project with a private sector mindset may not consider the very real possibility of a withdrawal in funding. This may result in an 'all or nothing' approach to systems development, rather than a set of incremental improvements where functionality is improved over time, so that not all efforts are lost in the event of a cut in funding.

It is unfortunate that large, impressive projects are often preferred by governments in developing countries, as these projects are seen as evidence of political action and as a response to a particular problem. However, the risk of failure is proportional to the size of the project, and large projects often fail (UNDESA, 2003). Private sector firms are often not under pressure to implement large, visible technology projects and are therefore not subjugated to such risks. Thus software designed in the context of the private sector may not consider the large scale typically required in e-government projects.

Ciborra (2005) has also talked of the gap between the public and private sectors. Given the way that private sector systems are designed, governments would have to change their view of the recipients of these e-government projects from citizens to customers. This represents a substantial paradigm shift and is the reason that many developing countries face difficulties with e-government applications (Pratchett, 1998). Ciborra (2005) identifies numerous problems with seeing a citizen as a customer. A customer needs market mechanisms, and the right to choose between different alternatives. This is not possible for an e-government application that operates as a monopoly. Furthermore, the private sector sees customers as a means to increased profitability, and it introduces price discrimination and similar mechanisms to create inequalities between customers. On the other hand the government must provide an equal service to all customers (citizens) to create a successful e-government platform.

2.3 Country Context Gaps

The final archetype defined by Heeks (2003) is where failures of e-government in developing countries occur due to country context gaps. Using an off-the-shelf solution from an industrialised country for a developing country will often result in large design-reality gaps. This is due to many reasons, such as differences in working cultures, skill sets, access to technology, and relevant infrastructure (thus country context gaps are closely related to hard-soft gaps).

Developing countries often have a poor IT infrastructure, which constitutes a further obstacle for the implementation of e-government (Tapscott, 1996). There may not be consistent and reliable electricity, telecommunications, and Internet access. For e-government to succeed in a developing country, it is first required to put the necessary technological infrastructure in place, so that all citizens can have equal access.

This lack of infrastructure can cause problems if an e-government model from a developed country is adopted in its entirety by a developing country. One of the benefits of e-government in developed countries is cost reduction in the transfer of information and online transactions. However due to a lack of infrastructure in most developing countries, the

telecommunications costs can be high, thereby nullifying this benefit (Schware and Deane, 2003). In situations such as this, it may be more appropriate to look at low-tech solutions that fit in with the existing infrastructure (Cecchini and Raina, 2004).

Numerous people in developing countries do not have access to information and communications technology, even if the infrastructure is available. The Digital Divide is ever present, and there is a large gap between the educated elite who can afford technology, and the uneducated poor who cannot (Basu, 2004). The divide is not just within countries, but between the developed and developing regions of the world, as is illustrated by the table below (Internet World Stats Website, 2006):

Table 1: World Internet Usage and Population Statistics (Internet World Stats Website, 2006)

World Regions	Population (2006 Est.)	Population % of World	Internet Usage, Latest Data	% Population (Penetration)	Usage % of World	Usage Growth 2000-2005
Africa	915,210,928	14.10%	23,649,000	2.60%	2.30%	423.90%
Asia	3,667,774,066	56.40%	364,270,713	9.90%	35.60%	218.70%
Europe	807,289,020	12.40%	291,600,898	36.10%	28.50%	177.50%
Middle East	190,084,161	2.90%	18,203,500	9.60%	1.80%	454.20%
North America	331,473,276	5.10%	227,303,680	68.60%	22.20%	110.30%
Latin America/Caribbean	553,908,632	8.50%	79,962,809	14.40%	7.80%	342.50%
Oceania / Australia	33,956,977	0.50%	17,872,707	52.60%	1.70%	134.60%
WORLD TOTAL	6,499,697,060	100.00%	1,022,863,307	15.70%	100.00%	183.40%

It is quite evident that with such a wide disparity in access to technology throughout the world, a solution in a country with high levels of connectivity will not necessarily work in a country with extremely low levels.

3. IMPLICATIONS AND CONCLUSION

The issues uncovered in this paper provide a relevant background for those partaking in the implementation of e-government applications. It is evident that practitioners must understand the importance of the specific context within which they are working. Such an understanding is critical if one is to consider bridging the gaps between the design and the reality of e-government applications. Furthermore, they can consider the cases of failed e-government implementation as a point of reference from which to identify certain areas which may be similar to the reality at hand and from this, understand the possibilities. This however must be taken with a pinch of salt, as no two situations are the same due to spatial and temporal discrepancies, and therefore outcomes can differ significantly even if a majority of factors seem to be similar to a previous case.

This paper uses the archetypes provided by Heeks (2002) as a mechanism for the categorisation of previous literature in the field. However, one may argue that this model is simplistic, and that the concept of 'gap analysis' can be applied to almost any situation of organisational or governmental change. It is fairly apparent that the larger the gap between a proposed and an existing system of working, the more difficult it will be to successfully

implement the new system, due to various factors that may relate to culture, preconceptions and existing rigidities. Another drawback of using such a categorisation when classifying issues is the subjective nature of interpreting what category a certain issue belongs to - some issues can arguably be included in more than one category. It is imperative to bear in mind that the most important issue is not the classification of the reasons for failure into different categories, but to understand the potential failings, thereby being more equipped to deal with such problems if they were to arise.

What is made apparent when using Heeks' archetypes (2002) to classify the literature in the subject area is the fact that large differences exist between the design and the reality of e-government applications in developing countries, which result in high percentages of failure for these applications. Considering Ciborra's (2005) view of e-government as a an investment by developed countries in their own security, using the technology as a form of control, the question that remains is whether the technology must be changed by designers to fit the context, or whether norms, structures, mindsets and work systems that constitute the context must be changed to fit the technology which is considered to reflect 'best practice'. Thus implementers of e-government must critically assess the situation and the technology at hand, and consider the motivations and the possibility of vested interests of various stakeholders involved in the project. By being aware of the situation, implementers can aim to create the circumstances that are where gaps are reduced, by social or technical change.

This paper does not try to paint a bleak picture of e-government in developing countries, and the limitations of such a study must not be ignored. Notions of 'success' and 'failure' are highly subjective. The outcome of something as difficult and complex to achieve as government reform, or higher levels of civic engagement by means of electronic media, may not be felt immediately. It is easy to overlook positive elements, which often arise as a result of certain perceptions and attitudes.

This literature review provides a brief overview of the reasons so many e-government projects fail in developing countries. In general, the major problem is seen to be the gaps that exist between the design and the reality of the system. The topic of e-government is still quite new, and perspectives are quite likely to change over time. There is scope for further research in both the areas of success and failure of e-government in developing countries, and undoubtedly as more real-world cases come forth, so will new interpretations.

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