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eGovernment as a Carrier of Context

RICHARD HEEKS

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Tel: +44-161-275-2800/2804 Fax: +44-161-273-8829
Email: idpm@man.ac.uk Web: http://idpm.man.ac.uk/

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Table of Contents

eGovernment as a Carrier of Context

Richard Heeks[1]
IDPM, University of Manchester, UK
richard.heeks@man.ac.uk
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Abstract

eGovernment is a global project of technology transfer, taking designs from one context into a different context. This transfer may take place from country to country or, more subtly, from one group to another. This paper focuses on the former type, using examples of 'e-transparency' projects. But it offers insights into all types of e-government project.

The insights suggest a complex interweaving between technology and context. We find that the context of design is inscribed into e-government systems in both explicit and implicit ways. These design inscriptions can mismatch the context of deployment/use, creating a contextual collision that can often lead to e-government failure. In other cases, though, there is some form of accommodation between the two contexts: users may appropriate inscribed elements to their own purposes, or there may even be a reciprocating accommodation between contexts leading to a viable system.

Factors that shape these outcomes – either failure or accommodation – are identified, as are the networks of interests that determine the design inscription and deployment accommodation processes. Conclusions are drawn about policy on e-government project design and development of e-government capacities; and about the value of knowledge-building for e-government from developing/transitional economy cases and from the literature on sociology of technology.

[1] An earlier version of this paper was presented at the conference on "The Internet and Governance: The Global Context", Oxford Internet Institute, 8-10 January 2004. Content is based partly on cases developed for the eGovernment for Development Information Exchange project. The project is coordinated by the University of Manchester's Institute for Development Policy and Management. The project was funded and managed by the Commonwealth Telecommunications Organisation as part of the UK Department for International Development's "Building Digital Opportunities" programme from 2002-2004. Project materials can be found at http://www.egov4dev.org/ or http://www.e-devexchange.org/eGov/topic2.htm

A. The Diffusion of eGovernment

Information and communication technologies (ICTs) have been in use in the public sector for more than fifty years. The advent of the Internet has given this usage more than just a new name – e-government – and a higher profile. It has also accelerated the diffusion of e-government applications worldwide. A growing number of public agencies in virtually every country are using ICTs (UNDESA 2003). Globally, government expenditure on ICTs is rising, and increasing numbers of government stakeholders – both employees and clients – are coming into contact with the new technology.

However, the diffusion process is not globally-even. We can identify a number of rich countries – such as the US, UK, Canada and Singapore – that are seen as the vanguard of e-government application. Then one can trace a continuum (e.g. in terms of e-government expenditure) through peripheral European nations and middle-income countries in East Asia and Latin America, to those countries in the developing world who make only very limited use of ICTs in government.

One should not, though, view this continuum simply as a set of isolated and relatively arbitrary categories: "leader", "second mover", "laggard", etc. Instead, one should recognise a connected system of global flows of knowledge, skills and artefacts from the epicentres of e-government in the industrialised world to transitional and developing economies. These flows – more uni-directional transfers than bi-directional exchanges – are but the latest example of a far longer transfer process that has characterised all efforts at public sector reform (Minogue 2001).

eGovernment can thus be seen to encompass a global project of technology transfer. As such, we might expect it to reflect some issues and findings consistent with those of the technology transfer literature (Braa et al 1995). Perhaps, above all, one of the themes of technology transfer has been failure. As might be expected – and unfortunately – this is certainly a theme found in e-government.

To explore this further, we can divide e-government initiatives into three types, based on outcome:

- *Total failure*: the initiative was never implemented or was implemented but immediately abandoned.
- *Partial failure*: major goals for the initiative were not attained and/or there were significant undesirable outcomes.
- *Success*: most stakeholder groups attained their major goals and did not experience significant undesirable outcomes.

We have very little data about rates of success and failure of e-government in developing/transitional countries. Failure is certainly the dominant motif of multiple-case studies of e-government in such countries (e.g. Peterson 1998, Baark & Heeks 1999, Berman & Tettey 2001), but these studies have produced no statistical data. Baseline estimates were therefore gathered for this paper from two sources. First, a poll of members of the eGovernment for Development Information Exchange, an online discussion network about e-government in developing/transitional countries. Second, analysis of more than 40 reports on e-government cases from developing and

transitional countries, submitted by practitioners studying at the University of Manchester.

Putting these sources together, the following working estimates are produced for e-government projects in developing/transitional countries:

- 35% are total failures,
- 50% are partial failures, and
- 15% are successes.

Is the prevalence of failure a problem? It is in a very direct sense because of the economic opportunity costs of resource investment in e-government failure, as opposed to success. Such opportunity costs are likely to be particularly high in poorer countries because of the more limited availability of resources such as capital and skilled labour. There are also softer costs – loss of political support, loss of morale, loss of credibility, loss of trust – associated with e-government failures (Heeks 2003a).

We will now move on to investigate the nature of e-government technology transfer in greater detail to help understand, among other things, some reasons why failure occurs. As illustrations, recently-commissioned case examples of e-transparency from developing and transitional economies will be used. In undertaking this investigation, though, it should be noted that the models and ideas laid out are just as applicable to e-government projects in the US, UK and other western nations, as they are to projects in developing/transitional countries. Indeed, one purpose of studying the latter countries is to provide insights into important processes that occur less visibly in industrialised countries. Some implications of this will be returned to later in the paper.

B. eGovernment in Context

eGovernment applications can be seen as isolated technical artefacts – the collection of hardware and software that can form the centrepiece of any e-government analysis. The shortcomings of such a techno-centric view, though, are readily apparent. eGovernment is connected to the social context in which it is deployed.

This can be seen firstly in the way that technology can impact that social context. For example, Brazil's e-procurement system COMPRASNET uses an automated reverse auction procedure (de Almeida 2002). Automation has reduced the costs of involvement in government procurement, and has thus expanded the number of small businesses who are able to participate. It has therefore affected the business context surrounding the e-government application.

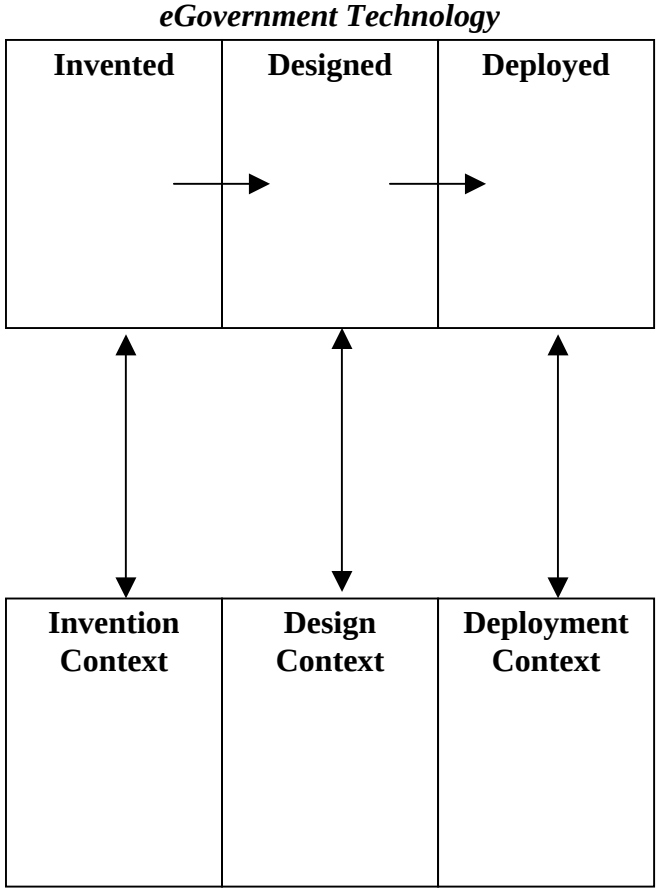
The relationship between technology and social context is bi-directional: the social context of deployment also impacts the technology during deployment. For example, a computerised personnel and payroll management system was introduced into the Cameroon Ministry of Public Service and Administrative Reform (Kenhago 2003). Many staff in the Ministry were unhappy about the new system, and the new approach

to decision-making it supported. Those staff refused to use the new system, making its deployment a partial failure.

It would be a mistake, though, to conceive the inter-relation between technology and context as some kind of simple duality. Fountain (2001) highlights one issue in her differentiation within e-government between 'objective technology' and 'enacted technology'. The first represents a background of already-invented technologies that are available to designers and other e-government decision-makers prior to any particular initiative. The second represents the particular design and deployment of e-government within a specific milieu.

We can use these ideas to construct a slightly more credible model of technology and context, taking an approximate stage approach: from the background of invented technology to the specifics of one e-government design to the deployment and impact of that particular design. That model is summarised in Figure 1.

Figure 1: eGovernment Technology and Context



This model is valuable in highlighting not merely the heterogeneity of technology, but also – critically – the heterogeneity of context. The context of invention is not the same as the context of design which is not the same as the context of deployment. As we will see later, these differences are fundamental to the outcome of e-government projects.

Yet this model is still incorrect in the impression it gives that technology is somehow separate from context. One can see fairly readily that technology forms one part of any context, alongside other resources like money and materials. More difficult to conceive, though, is the fact that context forms part of technology.

As well as the physical artefact, technologies contain within them an inscribed "vision of (or prediction about) the world" (Akrich 1992:208). This 'world-in-miniature' includes inscriptions of how processes will be undertaken; of the values that people will have; of the structures in which they are to be placed; etc. eGovernment technology must therefore be seen not in a uni-dimensional, reductionist manner but in a systemic manner as a group of related dimensions that are drawn from the context within which that technology is designed.

There are various ways in which we can conceive the contextual dimensions that are inscribed into e-government systems. In fairly simple terms, analysis of e-government failure and success case studies, from developing countries and beyond, shows that seven dimensions provide a model that can be applied in practice to a wide range of case studies (Heeks & Bhatnagar 2001): information (data stores, data flows, etc.); technology (both hardware and software); processes (the activities of users and others); objectives and values (the key dimension, through which factors such as culture and politics are manifest); staffing and skills (both the quantitative and qualitative aspects of competencies); management systems and structures; and other resources (particularly time and money).

For example, an e-democracy application was introduced in West Africa with the intention of making the electoral process more transparent (Boateng & Heeks 2003). Inscribed within the application's design were a number of inherent assumptions or requirements:

- *Information*: written into the design was the requirement that the information to be handled would be the traditional set of constituency results.
- *Technology*: the design assumed the presence of an electronic scoreboard at national headquarters plus c.350 networked PCs, one in each constituency office.
- *Processes*: the design inscribed a new process of disintermediated reporting, by which results were sent direct from constituencies to the central headquarters of the National Election Commission.
- *Objectives and values*: implicit within the application's design was an assumption that elections were determined on fair and rational grounds.
- *Staffing and skills*: the design required the presence of network and hardware/software installation skills prior to election, and of data entry skills and network operation/maintenance skills at election time.
- *Management systems and structures*: application design assumed the usual hierarchical management structures of the National Election Commission were still in place.
- *Other resources*: the design assumed US$20m to be available to cover total costs.

In reviewing these and other contextual inscriptions, one can see various different ways in which to conceive this inscribed context. Some elements are explicit – the information and the technology requirements, for example, are overtly laid out within the design. Other elements, though, are more subtle and implicit such as those about

the values involved. Yet further elements lie somewhere in between: the required skills are not laid out explicitly, but they are mentioned in general terms.

Many of these elements will be what Latour (1992:256) refers to as prescriptions: requirements, or assumptions, or expectations about the context of the user of the e-government application. This includes assumptions about the users' activities, skills, culture and objectives, and assumptions about the user organisation's structure, infrastructure, etc. (Boehm 1981; Suchman 1987; Clemons et al 1995; Wynn and deLyra 2000). Most of the inscriptions described above in the e-democracy application were also prescriptions about the user context.

But those prescriptions do not draw directly from the world of the e-government user. Instead, they are perceptions of the designer about the world of the user, so they are drawn from the world of the designer, not the user. eGovernment design is a situated action – an action "taken in the context of particular, concrete circumstances" (Suchman 1987:viii). This action draws elements of that context into the design:

> "Our technologies mirror our societies. They reproduce and embody the complex interplay of professional, technical, economic and political factors." (Bijker and Law 1992:3)

Designers themselves are part of and shaped by that context, and so their own cultural values, objectives, etc. will be found inscribed in the design (Shields and Servaes 1989; Braa and Hedberg 2000).

From this we see the importance of differentiating the context of e-government design from the context of deployment/use. That latter context may often have no direct impact on the design process. Instead, design inscriptions will be drawn from the design context – either directly or as contextualised perceptions about the world of the e-government user.

Two implications flow from this. First, that in understanding e-government applications, we need to pay close attention to the application designers and their context; particularly their values and their perceptions. Second, that there are dangers of a mismatch: between what designers inscribe into an e-government application; and the realities of the users' context.

B1. eGovernment Designers

eGovernment systems are designed by many different groups. However, a common pattern is that designers are, in some way, external to the context of e-government use. These externalities can take various different forms. For example, there is often what can be seen as a 'disciplinary externality' when the designer is drawn from a different work domain to that of the users. Typically this occurs when the designer comes from the IT department that is separate from the user department. The designer will characteristically have a different educational background, a different departmental culture, even a different 'language' from those who are to use the e-government application.

As the outsourcing of e-government design grows, there is growth in the use of private sector designers to create systems for public sector users. Increasingly, then,

there is a 'sectoral externality'. As with the gap of discipline, this particularly relates to the different values and knowledge a designer would have by being rooted in the private sector; lacking the understanding of the unique processes, systems, structures, and culture in the public sector.

eGovernment projects in developing/transitional economies are dominated by the process of global transfers described above. The carriers for these transfers are four main groups (Common 1998, Korac-Kakabadse et al 2000):

- International donor agencies. These have been a main channel for the transfer of new public management through their good governance agendas. These agendas are now incorporating and transferring the e-government message. The donors, providing a significant proportion of the income for government in many developing/transitional countries, create powerful leverage for e-government.
- Consultants. Consultants work within recipient governments for many reasons: to compensate for weak or absent skills; to legitimise pre-determined changes; as a required component of donor-funded change. They form an important component that both drives and shapes the reform agenda, including the e-government agenda.
- Information technology (IT) vendors. Worldwide, there is an inequality of knowledge, of skills, of experience between IT vendors and their public sector clients, with the former seen as possessing more of these important resources. Such inequalities are particularly acute in developing countries where the often-painted picture of 'virgins marrying Casanova' fits perfectly the imbalanced interactions that occur between public servants and vendors. As such, the vendors are often in a position to guide – even dictate – the direction and content of e-government.
- Western-trained civil servants. Many middle and senior civil servants in developing/transitional countries receive a Western education. This education can play an influential role in exposing those staff to Western ideas about new public management, and about e-government.

Because of the nature of these transfer channels, one will often find a 'country externality' where the e-government designer draws their values and knowledge from a different national context to that of the system users. The most extreme form of this occurs when industrialised country designers create an e-government system within and for an industrialised country context, and that system is subsequently transferred to a developing country. In such situations, the reality of local conditions in the developing country will not have been considered at all in the original design, and a considerable gap between the context of design and the context of deployment is therefore likely.

Even if some effort is made to develop an e-government system specifically for a developing country organisation, similar problems can arise. The dominant industrialised country stakeholders just identified – the consultants and IT vendors and aid donors – bring their context with them and, even if located in a developing country, they will inscribe that context into their designs; inscriptions that will mismatch the actual developing country context.

Problems can even occur where stakeholders from industrialised countries are not directly involved. One could argue that "the West" (as shorthand for industrialised countries) is not just a physical location, it is also a state of mind that has now come

to exist for increasing numbers of key figures in developing country organisations. This transfer of context could be said to occur directly through education of these key figures in the West or even in Western-developed educational systems, and indirectly through the leverage gained by Western domination of economic, political and cultural resources and channels. These individuals therefore might be seen to act as Trojan horses. Having been indoctrinated into a industrialised country mindset, they then devise Western-inspired e-government designs within developing country organisations. A straightforward example relates to language: the eShringhla system of information kiosks in Kerala, South India, was designed by a Western-educated technical team. They devised an interface in English – the working language of the team – rather than an interface in Malayalam, the major language of citizens in the state (Kumar 2002).

Whatever the nature of the externality of design – disciplinary, sectoral or country – we can see two types of design approach. One approach involves those who dominate the design process bringing with them an "If it works for us, it'll work for you" mentality that makes no attempt to differentiate between the contexts of design and deployment. One can fairly readily see that this will lead to problems because it will merely inscribe elements of the design context.

Other design stakeholders, though, do differentiate between the context of design and the context of use. As indicated above, this will lead to problems if the users' context is misperceived by the design stakeholders. In one South Asian Planning Ministry, for example, a computerised system was introduced to help make budgeting decisions more effective and more transparent (Anonymous 2003a). The design team was led by an overseas consultant, and it designed into the system a whole set of assumptions about the processes and culture of the Ministry. In order to function effectively, the design assumed that Ministry decision-making about project and programme budgets was formal, open and rational. In reality, decision-making had quite different qualities – it was informal, closed, and highly politicised. The system's design inscriptions therefore mismatched Ministry realities.

One can relate these design failures to thoughtlessness or shortage of time or lack of competence on the part of designers. However, the problem runs much deeper than this. At one level of depth, we can ascribe problems to the externalities outlined above. Designers are distanced from the user context and they therefore cannot or do not value particular characteristics of that context, or – because of their different mindsets – they are unable to identify or comprehend particular characteristics of that context.

But problems run deeper still, relating to the nature of discourse in public sector organisations and the way in which that discourse can be disconnected from the organisation's underlying realities. The roots of this can be seen in Argyris' notions (e.g. Argyris 1985) of two levels of theory that guide our action: espoused theory and theory-in-use. "Espoused theory represents the values and beliefs individuals claim to hold and publicly support, while theory-in-use represents the values and beliefs individuals actually follow" (Clemons et al 1995:11).

Public discourse therefore differs from private motivations and actions (Suchman 1992). Such patterns seem likely to be found everywhere, but they have particularly

been noted in the public sector in developing/transitional economies where there are "strict formalities covering a substantially different reality of informal behaviour, or where political behaviour takes place under the cover of a formal bureaucracy" (Avgerou 1990:237). One key element of this pattern is the inclusion in public discourse of reference to a guiding framework of formal, organisational-level rationality that may bear little or no relation to much more personalised and politicised rationalities that guide decision-making in practice. Another element is the exclusion of critical, highly-sensitive issues that are implicitly deemed 'undiscussable'. Such issues may include corrupt behaviours and major shortcomings in the performance of the organisation.

All these issues arose in the South Asian case described above. The image portrayed is that of the 'rotten coconut'. On the outside, it appears hard and normal, like any other example of its kind. On the inside, though, everything is completely different. The designers stood on the outside. They had relatively little time to scratch beneath the surface of the organisation. Coming from IT backgrounds, from outside the Ministry and with leadership from overseas, their contextual backgrounds – hence their culture, language and systems of knowledge – were quite different from those of organisational users. And where they did engage with Ministry staff, that interaction was a discourse of organisational rationality, talking only about the 'shell' of the coconut not the fruit inside. The designers thus designed a fiction, basing their e-government system on some mythical image of organisational rationality, an absence of politics, and an absence of corruption that bore little relation to the true functioning of the organisation.

Avgerou (1999) describes a similar case from IKA, the Greek state's main social security provider. The overt mission and activity of this state agency – as evidenced in public discourse in and around the agency – was efficient, effective provision of public services, with a commitment to reform through rational techno-economic modernisation, including wide-scale computerisation. It was to this overtly-stated mission and activity that all e-government systems for IKA were designed. Designers were unable to penetrate beyond the overt rationality to get to a deeper level of functioning: "The covert, undeclared but highly institutionalised mission is as a politically manipulated apparatus for employment within a country following an uneven industrialisation process." (Avgerou 1999:13). As a result, their e-government design bore little relation to a major worldview within the client organisation.

These cases seem to reflect a familiar picture, at least in relation to some types of e-government system and particularly when applied in developing/transitional countries. Designers inscribe within the e-government system contextual elements related to modernity, rationality, formality and efficiency. These elements meet a very different contextual reality when they are introduced into many public agencies. This is a contextual reality that, beneath a veneer of formal rationality, is traditional, self-interested, informal and politicised.

Such a mismatch in the public sector – between the 'techno-economic rationality of western modernity' (Avgerou 1999:1) and a more traditional and politicised worldview – is neither new nor unique to e-government. Taking a longer-term view, we see this as a pervasive conflict within colonial systems which, in turn, has run on through path dependency into post-colonial systems (Berman & Tettey 2001). Taking

a broader view, we see the same tension within the transfer of new public management; the western-context component conveyed into different contexts by the carriers identified above.

B2. Implications of Design-Use Mismatch: Contextual Collision

It is therefore not uncommon that e-government systems have elements of context inscribed into them – elements direct from the designer's context or elements misperceived from the users' context – that are mismatched to the actual elements found in the users' context. We can see this as a type of 'contextual collision'.

What, then, is the impact of this contextual collision? Do we just get the infinite heat of failure when the irresistible force of design context meets the immovable object of contextual reality? In many cases this does seem to be the outcome. Certainly, all of the formally-evaluated e-transparency cases were seen as either partial failures or as largely unsuccessful when judged against their stated objectives.

Contextual collision/mismatch leading to failure may occur in relation to the more objective and explicit dimensions of inscription. For example, the Gyandoot project set out to provide government services in a cost-effective, transparent manner to citizens in a poor, rural district in India by using a chain of village-level Internet kiosks (Sanjay & Gupta 2003). The project's design inscribes an explicit contextual requirement for both electricity and telecommunications infrastructure to be available on a regular basis. In reality, in quite a number of the villages, this requirement was not met. As a result, the kiosks fairly quickly moved into a self-reinforcing spiral of low availability, declining use and declining income that led to closure.

In other cases, more subtle and implicit dimensions of inscription are involved in contextual collision and failure. For example, the police force in Andhra Pradesh state, India, introduced a network-based e-government system (eCOPS) to help improve the transparency of handling criminal cases (Anonymous 2003b). The project's design inscribes an implicit contextual requirement for police officers to be honest, efficient and rational in their work. In reality, this collides with the real context of use in which the work of many officers is highly politicised and self-interested. As a result, the inscribed contextual requirement is not met and police use of the system has been very low, leading eCOPS to be largely unsuccessful.

In these situations, e-government seems far from being a triumphant standard-bearer for modernity. Instead, it is the empire of the traditional and politicised institutions that strikes back. In some cases, the local context simply spits out the technology in the form of total failure: the e-government system never becomes operational. A more subtle reaction is some form of assimilation and appropriation of e-government systems by key stakeholders within the context of deployment and use.

Those stakeholders commandeer some of the e-government system's inscribed features to their own purposes whilst leaving others to one side. One form of this emerges in the support that senior public officials give to the implementation of an e-government system alongside the complete lack of support they give to operational use of that system.

The main trigger for the eCOPS system just described was a high-profile crime case (ibid). The identified perpetrators were closely associated with the incumbent political party in the State. The police force – being strongly politicised – did nothing to bring the perpetrators to justice. There was a public furore which threatened serious political damage for senior officials of the ruling party. They spearheaded the introduction of eCOPS as an attempt to lessen this damage.

Those officials appropriated certain contextual inscriptions within the eCOPS system; inscriptions that provided the system with an image of objectivity, fairness, and rational justice. These inscriptions were appropriated to the officials' own political purposes. The system was forcefully publicised during its planning, design and initial installation, playing heavily on its inscribed values and the difference between these values and the existing contextual values of policing in the State.

By the point of initial installation, the system had served its political purpose. Its contextual inscriptions were not required to make an actual change to local contextual reality; merely to provide a temporary appearance of potential change. From then on, there was little attempt to overcome operational resistance and other problems. Existing institutional values and procedures were able to continue largely unchallenged by the threatened insertion of values and procedures from a different context.

This example of appropriation can give the impression that e-government systems are 'ingested' by the local context without having any effect on that context. Yet this is unlikely to be true. Indeed, in some cases, one can see e-government managers allowing user appropriation of new systems with the deliberate intention that appropriation will change the deployment context.

For example, donor-funded consultants in Bangladesh had been asked to place information from departments of the Ministry of Communication on the Web, in order to improve data flows from government to citizens (Ahmed 2003). They knew that the design requirements of such a project were quite seriously mismatched to current realities of the user context: users were averse to the new technology; they lacked skills in using the Web; they had little or no ownership of the Web project. The consultants therefore intentionally helped key users to appropriate Internet-based technology to their own purposes. The users were allowed to create personal Web pages; to chat online to friends; to send informal email messages; and to participate in unofficial discussion fora.

At one level, this can be seen as an appropriation of e-government technology by a self-interested, informal and politicised local context. At another level, though, these actions were changing some of the factors within that context, such as opinions about ICTs, and ICT-related skills and knowledge. Over a period of months this, in turn, changed attitudes towards the proposed e-government project from neutral/negative to more positive.

What happened here, then, was a change in project design that led consequently to a change in user realities. This is a simple example of emergent changes in design and in user reality that may occur during an e-government project. These can be

envisaged as continuous reciprocating improvisations between design and reality that, if success is to be achieved, will seek accommodation and adaptation between design and reality sufficient to achieve workable closure (Orlikowski 1996).

A similar but more complex interaction between design and reality was seen when a national welfare agency in Southern Africa decided to integrate two of its pension funds using an ICT-based system (Kekana & Heeks 2003). Within the e-government system's design were inscribed requirements for particular skills that should be available within the agency; skills in the implementation of complex, networked information systems. When it was seen that, in reality, the in-house skills were not available, the design was altered to require the presence of such skills from hired consultants. Such consultants were hired but, over time, it emerged that they did not have exactly the required skills in reality. Some small modifications to both design and reality were made possible through the use of some improvised training. However, it became apparent that this could not close the gap between inscribed and actual skills. The system design therefore had to be altered; cutting out some of the complexities and extending the project timescale.

In this situation, one does not see the particular domination of one context – the inscribed context within design, or the real user context of deployment – over another. Instead, we see contextual collisions leading to reciprocation with first one context, then the other, making incremental accommodations as project actors seek to reduce the mismatches between the two in order to achieve e-government viability.

In the Southern Africa case, the reciprocating improvisations were observed within a single e-government project. But we may also see the 'contextual collision' identified earlier having a longer-term impact that spreads beyond a single project. Long-term studies of e-government are regrettably rare but a few show a pattern of initial failure followed by what Fountain (2001) sees as the awakening of latent possibilities within the government agency.

Madon (1992) observed this in her longitudinal study of computerisation in rural government departments in India. An initial three-year project was largely unsuccessful, with little or no use of the installed ICT infrastructure. After this period, though, "the sheer existence of the microcomputer … prompted some degree of curiosity and self-learning among administrators at the local level." (ibid: p215). What began as a top-down project that failed to impose an externally-inscribed context changed after some years to an end-user-driven exercise in which local civil servants began to appropriate the "foreign" technology to their own context, including their own work needs and interests.

C. Analysis and Implications

eGovernment is a global project of technology transfer, taking designs from one context into a different context. In some situations, the process of transfer and the difference in these contexts is writ large: e-government systems designed within the context of one country are transferred for deployment to the context of another country. In other situations, transfer and context are more subtle. They occur, for

example, between one part of a government agency (e.g. the IT department) and another (the user department).

In this paper, we have mainly focused on the former type, because they offer the most clearly-defined differences between contexts and, thus, the clearest appreciation of issues of e-government design, transfer and deployment. But those issues will apply everywhere. We have therefore gained insights into the introduction of e-government systems everywhere.

These insights suggest a complex interweaving between the technology and context of e-government. We must first recognise – as already indicated – that there are different contexts of relevance to e-government; in particular, the context of design and the context of deployment/use. These two are drawn into relation with one another because the context of design is, in some ways, inscribed into the e-government system in both explicit and implicit ways.

Because designers are typically external to the context of e-government use, their contextual inscriptions often mismatch the context of use, leading to some form of collision between different contexts during the process of e-government implementation. In many cases, this is seen to lead to some kind of e-government failure: either partial or total.

In other cases, though, there is some form of accommodation between the two contexts. This may take the form of users appropriating some inscribed elements of an e-government system to their own purposes. It may also take the form of a mutual, even reciprocating, accommodation between the contexts that – over a shorter or longer period – may see both e-government design and user realities alter in order to move towards some form of workable system.

To understand which of these different outcomes transpires, we can identify a set of factors that play a part. The first is the nature of the technology design involved. We should not see all e-government designs as set in stone; as inflexible monoliths that seek to bend user contexts to their will. Instead, as instanced above, there will be ways in which users, in their deployment/enactment of the technology, appropriate designs to their own purposes and contexts (Orlikowski 1996). Investigating this further, we can delineate a continuum of e-government applications based on Akrich's (1992) notions of obduracy and plasticity of artefacts (see Figure 2).

Figure 2: Deep- vs. Shallow-Inscribed eGovernment Applications

At one end of the continuum, *design-imposing applications* can be seen as largely constraining. These are e-government applications that contain 'deep inscriptions' and

which – to be successful – either require or impose a strong set of processes, values, competencies, systems, etc. An example would be the decision support system built into the South Asian planning/budgeting system described above. This requires or imposes a series of rational design inscriptions: about the objectivity of information that is present in the system; about the formality of processes and management involved; about the skills and role of people; about the presence of organisational strategies; about the rationality of organisational culture; about the absence of organisational politics; etc.

Deep designs – which often have many strong implicit elements – are obdurate and will resist attempts at improvisation during deployment, thus reducing the chances of local appropriation or accommodation. Users are obstructed by the system's matrix of 'contextual concrete', in which all contextual elements are bound together on a take it or leave it basis. Users must either reject the system (as they mainly did in the South Asian case), or accept the totality of its contextual prescriptions. If their own context does not match those prescriptions, then they must undertake significant alterations in their context – changing data flows, changing work processes, developing new skills, implementing strategies, altering work cultures and values, etc. – in order to make their own contextual reality match the requirements of the e-government application.

In certain fields of e-government, there seems to have been a deliberate focus on the design-imposing approach; seeking to choke off opportunities for user appropriation and improvisation. For example, most of the reviewed cases of e-transparency incorporated a conscious decision to reduce design flexibility because staff autonomy was often associated with corruption and self-interested behaviour. Instead, the idea of inscribed contextual concrete was favoured because it was seen as allowing users little room for manoeuvre and, hence, little room for self-interested behaviour.

At the other end of the continuum, *reality-supporting applications* can be seen as more enabling. These are e-government applications that contain relatively 'shallow inscriptions'; that is, they require or impose few systemic contextual components. A generic example would be a word processing application. This makes some design assumptions about skills, about technical infrastructure, and about cultural values related to technology and to documentation. However, these assumptions are far fewer than for the decision support system.

Shallow design inscriptions – often with more explicit and fewer implicit elements – are more plastic and more amenable to improvisation within, appropriation by and accommodation with the users' context. Observation of civil servants' use of word processing confirms this. They use this application for formal purposes, such as writing government reports or official letters. But they have equally appropriated it to their own interests, using the application for informal notes, personal letters, etc. As a result, reality-supporting applications have succeeded far more often than design-imposing applications (Heeks et al 2000).

A second factor will be the way in which the overall e-government project is designed. One aspect of project planning relates to the extent to which e-government designers are or are not exposed to the realities of the user context. For example, the Sri Lankan State Accounts Department decided to introduce a more transparent approach to publication of financial statements, enabled by the Web (Chandrasena

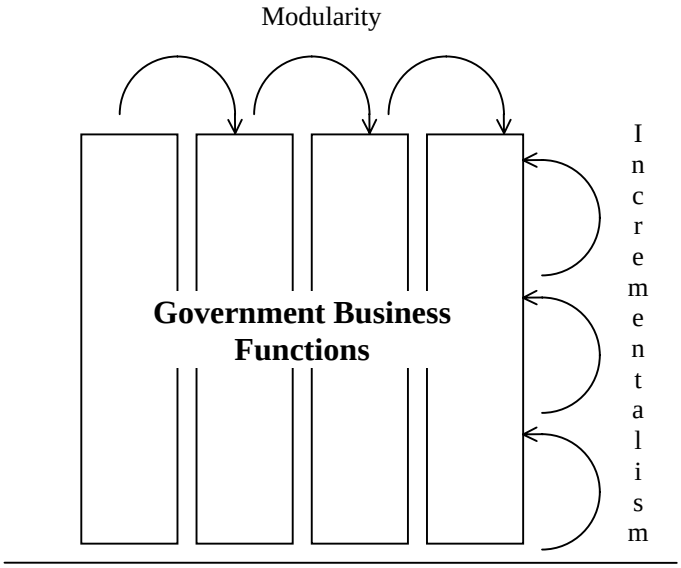
2003). Specific measures were introduced within the project to help reduce the mismatch and collision between the design and the use context.

These measures included the long-term presence of design consultants, enabling those consultants to move beyond the 'discourse of rationality' and to see behind the organisational veneer to the real values and processes within the context of e-government users. There was also a strong commitment to continuous user participation through seminars, group meetings and one-to-one sessions in order to help feed user context realities into system design. These realities were demonstrably included in the design, thus encouraging further communication to further close the gap between the inscribed context of design and the real context of Sri Lankan government users.

The capacity for reciprocating accommodations between these two contexts was enhanced by another aspect of project design: the division of the project into a series of sub-elements. High divisibility in an e-government project reduces barriers to improvisation, increases opportunities for learning, and limits the extent of change during any given time period in one of two ways (see Figure 3):

- modularity (supporting one business function at a time by allowing separation of, for example, accounting and personnel functions), and
- incrementalism (providing stepped levels of support for business functions by allowing separation of, for example, clerical and management support)

Figure 3: Modularity and Incrementalism in eGovernment Projects



In the Sri Lankan case, the division of the project into incremental steps meant it was easier either to accommodate the user context to the e-government design (for example through a series of brief training sessions), or to accommodate the design to the user context (for example through incorporation of accounting processes customised to local needs and procedures). It has also been easier to learn from limited and partial failure in early steps and incorporate that learning into subsequent

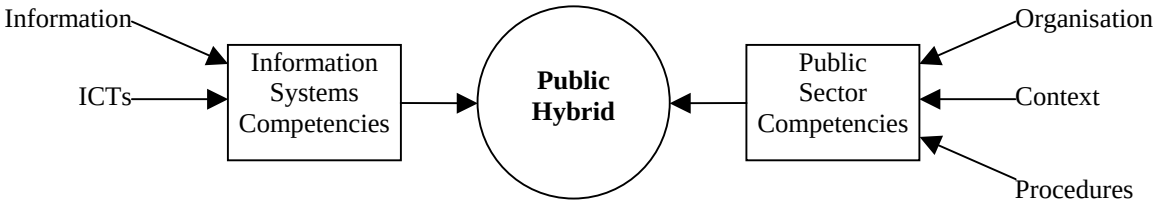
improvisations of both design and the reality of the user context. The project has not been overwhelmed as it would have been by a unified 'big bang' approach.

One final element of project design that facilitates successful 'contextual accommodation' was noted above. This was the way in which some projects deliberately permit users to appropriate the e-government technology to their own interests and values. This allows an initial accommodation between user context and new technology, which can then form the basis for a later, easier initiative to build more objectively-valuable e-government applications on the base of appropriated technology.

Technology and project design factors may allow room for local accommodations, but the ability of implementers in developing countries to enact such improvisations will depend partly on a third factor: local capacities. A wide range of such local capacities is required, but there is a central requirement for hybrids (Earl 1989). In a general sense, the type of hybrid required to avoid failed contextual collisions in e-government relates to both the external context of the designer and the internal context of the user. That hybrid can be envisaged either as a bridge between those two contexts, or as a straddler with a foot in both those contexts.

In a situation where the external context of the designer is that of information technology/systems and the internal context of the user is that of the particular line function of government, then an e-government hybrid will be someone who understands both the context, organisation and procedures of government *and* the role of information systems in the public sector, as illustrated in Figure 4 (Heeks forthcoming). This was the case in the Sri Lankan project just described. The key nodal player was the Director of the State Accounts Department: a hybrid who combined many years of accounting experience with long experience of using ICTs in government.

Figure 4: One Type of eGovernment Hybrid



These three factors – technology design, project design, and local capacities – are enablers that facilitate accommodations between the inscribed context of design and the actual user context. For such contextual accommodation to occur, though, needs more than enablers – it also needs drivers.

To understand the drivers that shape design and deployment in an e-government project, it is useful to draw on ideas from actor-network theory (e.g. Latour 1992, Walsham 1997). In brief, these focus on the way in which – during an e-government project – different groups of actors create and maintain networks of aligned interests.

It is those networks – principally the dominant network of interests – that can be seen as a key driving force within an e-government project. The particular nuance of actor-network theory is that the actors within a network are not merely human beings but also nonhuman actors including technological artefacts such as the e-government system itself.

Within the context of design, there will be a dominant network of interests that seeks to have those interests inscribed into the e-government system. Within the context of deployment, there will be a network of interests that seeks to speak on behalf of (i.e. support) the e-government system. But, as we have seen, there may equally be a network of conflicting interests that resists the inscribed interests and context of the e-government system and/or which seeks to appropriate those inscriptions.

It is in the relationship between these networks of interests that we will divine the drivers either to conflict and failure, or to accommodation and some form of working e-government system. In the case of the eCOPS system discussed earlier, the dominant network of senior politicians ensured that an objective and rational set of police procedures, values, etc. was inscribed into this e-government system during design. This network was maintained until the moment of operation, when it dissipated, having fulfilled its political function. From that point, a new dominant network emerged – of serving police officers resistant to the system because it ran counter to their interests, coupled with a population of citizens resistant or apathetic towards the system because they did not trust the police. The initial network of interests had a momentum sufficient to get the hardware and software infrastructure installed. The emergent network of interests ensured that no further accommodation was possible. The gap between the inscribed design context and the real context of police/citizen interests could not be bridged, and the system was close to a total failure.

By contrast, in Romania after 2000, a powerful network of interests was created around the issue of tackling corruption in government (Ailioaie & Kertesz 2003). This included senior government officials, EU commission representatives, key foreign ambassadors – all concerned with EU accession and good governance – plus some citizen and business groups. This network's drive led, among other things, to the development of the *e-licitatie* system: an e-procurement system to handle purchases of various types of goods by public agencies.

The network of interests led not merely to the inscription of various passive anti-corruption values within *e-licitatie*, but to the active inscription and delegation of previously-human agency to the e-government application, which undertook automated decisions about contract allocation that had formerly been undertaken by (fallible, corruptible) humans. The strength of this combined network of people and application was sufficiently strong that it forced an accommodation of the user context – combining both public servants and private sector suppliers – to the design of the system. This e-procurement system now handles hundreds of millions of US$-worth of transactions annually and appears to have significantly reduced opportunities for corruption.

One final point will be made about networks of interest and inscription. The dominant network of interests within the context of design not only determines what

contextual elements are inscribed into the e-government system. It also determines what elements are not inscribed into the system. For example, one objective behind the introduction of computerised train reservations in the Indian Railways was to reduce corruption in the allocation of reservations (Heeks 2000). This e-government project was only able to proceed once there was an alignment of interests between two powerful groups: the system designers and the railway stationmasters. That alignment itself was only possible once the designers agreed to remove from the system design procedures that automated a particular allocation of reservations controlled by the stationmasters. The stationmasters thus retained manual control over this pool of reservations whilst supporting automation of the larger set of reservations previously controlled by railway clerks. This is one instance of a broader pattern by which senior officials can be recruited into networks of support for e-transparency systems when they see the system will shine more of a spotlight on the corruption of junior staff and thus, potentially, cast their own misdeeds deeper into the shadows (Frasheri 2003).

C1. Implications for Policy and for Research

This paper has suggested a number of ways in which an understanding of context and inscription within e-government systems can help support greater accommodation between such systems and their contexts of deployment and thus, by implication, help reduce the risks of e-government failure. At a policy level, this has suggested various prescriptions for the way in which e-government projects are designed. It has also suggested the importance of development of local capacities that will enable appropriation of e-government designs. This appropriation can run the continuum from use, through customisation of design, to full local management of e-government projects.

One cornerstone of this will be the development of some form of local hybrids who will play a key role in the spread of e-government. Hybrids will need, as illustrated in Figure 4, to bridge gaps between IT and the 'business' of government. In the context of developing/transitional economies they will need to bridge more than this since most e-government professionals "indoctrinated in the rationality of modernity, have little capacity to recognise the clashes of rationality they encounter when they strive to emulate the effects that ICT has 'enabled' in the western economies in the context of developing countries." (Avgerou 1999:14). Unfortunately, to date, schemes to develop hybrids in developing/transitional countries and, hence, local hybrids themselves have been virtually non-existent (Mundy et al 2001)

The sense of 'local' used here relates to geography and countries. But we have constantly sought to make the point that the ideas developed here apply equally to e-government in industrialised countries. Within these contexts, the notion of 'local' is that of nearness to the user and the context of e-government usage. Hybrids will not only be those bridging between IT and the business of government, but may also – given the significant outsourcing of e-government contracts – be bridges between the context of private sector design/inscription and public sector use. Other strategic points will also apply to industrialised countries: encouraging designer exposure to user realities, project divisibility, and – in certain cases – user appropriation of e-government technology.

In this we see a pointer for the e-government research agenda. In studying e-government cases from industrialised countries, it can be hard to disentangle the context of design from the context of use because of the proximity (in all senses) of these contexts. As a result, we can easily miss or misunderstand critical processes that underlie the success and failure of e-government.

Herein lies the value of researching e-government cases from developing/transitional countries. The contexts of designer and user are often distant in physical, cultural, economic and many other ways. The remoteness of designers means that their contextual inscriptions are liable to be significantly different from user realities. So, too, are the inscribed assumptions that remote designers make about the user context. Contextual differences and conflicts are therefore more extreme and more explicit and, as a result, are easier to identify and to understand. eGovernment cases from developing/transitional economics therefore provide valuable data that helps illuminate underlying structures and processes. Put another way, such cases make it easier to move beyond the black box approach to e-government (Akrich 1992).

However, the value of these cases will only emerge if we can move beyond the current marginalisation of research materials developed from developing/transitional economies (Heeks 2003b). This marginalisation draws from the assumption of a one-way flow of experience, knowledge and ideas: from the 'North' to the 'South'. Unfortunately, as seen earlier in the paper, this one-way flow is institutionally entrenched: historically from colonial times, and contextually within the broader framework of new public management and related reforms.

It will remain an uphill struggle to convince readers that developing/transitional economy cases can cast light on the inner workings of e-government in a way that OECD-based cases may not. Perhaps easier to accept is the relevance of models and ideas from the science and technology studies (STS)/sociology of technology literature (Wajcman 2002). It is these that will help us to understand the institutional context of e-government; its transaction costs and path dependencies; the contextual inscriptions within e-government; the mechanisms of user appropriation; and the networks of interest that ultimately determine the outcome of e-government projects.

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