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Abstract

Most of the e-government efforts around the world have been sporadic and unplanned. “Technological thrust” rather than “citizen orientation” has been the driving force for most of these initiatives. This paper provides a comprehensive e-government transformation framework, which views this change as a “guided evolution” contingent upon the presence of certain “enablers”. E-government initiatives present the opportunity to reengineer the government processes, procedures and systems, which not only provide an enhanced value to the citizens but also increase the business productivity. The proposed framework explores the journey of e-government transformation through the six milestones namely - operation, uni-directional information flow, multi-directional information flow, service delivery, automated transaction and integrated transaction. We also describe the five “enablers” and the four typical “resource drainers” associated with e-government transformation.

Keywords: E-government, Citizen, Internet, Government

1. Introduction

The World Bank describes electronic government (e-government), as the use of information technologies (such as wide area networks, the Internet, and mobile computing) by government agencies to transform relations with citizens, businesses, and other arms of government. These technologies 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 (World Bank E-Government Website). The recent advent of the Internet and the explosion of electronic commerce (e-commerce) in the private sector have brought upon public organizations increasing pressure and incentive to embrace the technology as a means to improve the way governments operate (Lee et al. 2001). Several initiatives are being being taken by governments in this direction. A comprehensive survey identified over 1300 such e-government initiatives in US federal government alone (Balutis 2001). Barring a few countries, the implementations of e-government efforts have been more or less sporadic, chaotic and unmanageable (Stowers 2000; West 2000). The World Bank website mentions that even the most mature countries have tapped less than 20% of the potential of e-government. Hence there appears to be an imminent need for studying the subject in an organized way so that governments around the world are able to use ICT to its full potential for the benefit of its citizens. This paper integrates the various studies of ICT adoption in government so as to understand the dynamics of e-government and its evolution.

There are three major functions of the government: policy making, program administration, and compliance (US Government 2002). E-government should be treated as a system reform process and not merely as computerization of government operations. Critical to its success is the understanding of the fact that e-government is not just about the automation of existing processes and its inefficiencies. Rather, it is about the creation of new processes and relationships between the governed and the governor (CDT 2002; PCIP 2002).
A few years ago, obtaining an import export license in Singapore required applicants to fill out 21 different forms and then wait for 15 to 20 days for the 23 government agencies to process the request. But since the government launched TradeNet (an electronic data interchange network for trade administration), applicants have to submit only one online form, and they may receive a license as soon as 15 seconds later (Kibsi et al. 2001). This example illustrates how the process has been reformed by integrating the various government agencies and in effect provides a fast and efficient single window to the businesses. Had the efforts of e-government gone about simply automating the systems in all the 23 government agencies, the benefits would not have been of this order.

2. Framework For E-Government

The e-government framework consists of the following categories of interactions:

- Government-to-Citizens (G2C): - The aim of this interaction is to provide better and easier access to the various government services.
- Government-to-Business (G2B): - This interaction is aimed at reducing government’s burden on businesses by eliminating redundant collection of data and better leveraging e-business technologies for communication.
- Government-to-Government (G2G): - This interaction is aimed at streamlining the information and operational flow among various departments, ministries, and levels.
- Citizen-to-citizen (C2C): - Interactions among citizens regarding their own issues will lead to a better understanding of their own problems.
- Government to Foreign Government (G2F): - This refers to the cross border interaction among the governments.
- Electronics for Government (E4G): - This intragovernmental operation refers to making better use of the modern technology to reduce costs and improve quality administration, by using industry best practices in areas such as supply-chain management, financial management and knowledge management.

The Economist (24 June 2000) proclaimed that after e-commerce and e-business, the next Internet revolution will be e-government. The transformation from traditional government to E-government is an evolutionary process. It consists of stages of growth namely cataloguing, transaction, vertical integration and horizontal integration (Layne & Lee 2001). In this paper, we see e-government transformation as a “guided evolution” contingent upon certain “enablers”. The presence of these enablers paves the way for e-government while the presence of resource drainers inhibits the evolution towards e-government. During this process of guided evolution, e-government passes though six milestones. The complete framework of e-government transformation showing the six milestones, five enablers and four resource drainers is shown in Figure 1.

**Operation (Internal Computerization):** The first milestone of mass e-proliferation in government is at the operational level, e.g., office automation helps the government at the operational level. This simply means performing the routine office functions of the government in a more efficient and effective way by the use of ICTs. The rationale is that before e-government can take off, governments need to computerize their internal operations and be receptive to the use of ICT. It is only after this that they can establish electronic linkages with parties outside the government.
Figure 1: E-Government Transformation: Milestones, Enablers and Resource Drainers

**Uni-directional Information Flow**: Uni-directional information flow is the second milestone. In this category, the information flow is not limited to within the organization but it crosses the organizational boundary. The one direction in which the information flows is from the Government. It mostly refers to G2C and G2B informational Websites.

**Multi-directional information flow**: This milestone signifies informational flows not only from the government but also to the government. It may also include informational flows among the various citizens through government initiatives. These multidirectional interactions result in providing relevant information to the citizens. This saves the citizens time and effort as they are able to get the desired information through e-mails or through the Web.

**Service Delivery**: Provision of customized online information is also a service given to the citizens. By service, we mean those governmental activities that fall under the purview of program administration and compliance, which do not entail online money transaction. For providing online services, the concerned departments must have interlinked databases running at the backend, which provide the “queried” information or service to the citizens. In contrast to multidirectional informational flows, the informational service delivered to citizens is in real time and customized to their needs.

**Automated Transaction**: This milestone in the e-government transaction marks the beginning of money flows online. This may involve substantial involvement of other stakeholders for financial transactions. For achieving any money transaction online, substantial investments have to be made in terms of technology and infrastructure. Involvement of banks and credit card companies, presence of secure servers, backed by
stringent cyber laws and a responsive legal system are an absolute necessity for this milestone to be achieved.

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**Table 1: Summary of e-government milestones: interactions and flows**

**Integrated Transaction:** This milestone implies integration of services and transactions of citizens and businesses with the government. Service integration includes both point of delivery integration and ‘back office’ integration (Li 2003). A utopian condition will imply that the complete databases of all the citizens and businesses are available with the government. These databases have an online input about the various activities of its citizens from various sources. The system is intelligent enough to calculate and debit the various taxes, renew licenses, passports and provide other services to the citizens with little or no manual intervention. This involves horizontal integration of databases of various ministries, government departments, other stakeholders like banks, service providers etc. Effort in this direction is still going on even by the most developed countries.

3. **Enablers**

The various milestones of the government do not evolve on their own. Their evolution is contingent on the presence of certain “enablers”. These enablers are necessary for the e-government transformation in a nation.

**Infrastructure:** E-government initiatives require building up a complementing ICT infrastructure. Internet connectivity, bandwidth capacity, secure servers, computers, etc. are all prerequisites for the successful implementation of e-government. Countries differ from each other in terms of their resources and their ability to allocate them for IT related projects. The lack of finance for capital investment in new technology is recognized as a major barrier for e-government because IT is often not seen as a priority when competing for scarce resources against other claims for capital investment (Li 2003). So governments have to come up with new ways to develop their infrastructure e.g. the collaborative model being used for vehicle registration in Arizona State, US. The government vehicle registration website is being maintained by IBM based on a revenue sharing model (Kibsi, Boer, Mourshed & Rea 2001).

**Political Will:** For maximum benefit to the organization, electronic commerce needs to be taken as a strategic business decision, not merely a technological one (Goldberg & Sifonis 1998). Realizing this fact, many governments are coming up with a strategic e-government agenda for their country. The top management support elevates the role of IT in an
organization leading to greater business use of Internet (Teo & Too 2000). This proposition is
equally valid for a successful e-government transformation. Without a strong political will
and bureaucratic support, the e-government transformation will remain an unrealized dream.

**Knowledge:** Li (2003) concluded that e-government is more of an organizational change
issue rather than a technological issue. Government servants and bureaucrats may resist e-
government projects and may prove to be a hindrance in adoption of new procedures.
Dispelling fears of the government officials and explaining the importance of e-government
programs and their commensurate benefits are of utmost importance to the implementation of
any e-government initiative. Apart from the government officials and political leaders, it is
essential for the citizens to understand the potential of e-government and its utility to them.
They also have to learn to use the various electronic methods to be able to use them to their
advantage in an e-government environment. Mass e-literacy programs have to be adopted by
the government to provide the citizens with the requisite knowledge to be able to make use of
e-government systems.

**Trust:** Adoption of e-government initiatives by citizens and businesses is also an issue of
their trust on these technological initiatives. Developing trust of the citizens on electronic
payment systems and online approvals involves a considerable effort on the part of the
government. Development of trust not only involves adoption of secure systems but also
involves communicating and educating citizens that such systems are as secure as traditional
systems. The US e-government efforts are making use of e-authentication to develop trust
among citizens.

**Legal framework:** Every year in the US, credit card fraud tops US$400 million, damage
from hacking computers like the Philippines Love Bug virus tops US$12 billion and software
piracy tops over US$1 billion. Global money laundering and capital flight is now believed to
amount to US$500 billion annually (Henderson 2003). To prevent the mavericks from
throwing a spanner into the e-government initiatives of a nation, it is essential to have a well-
enunciated e-legal framework. This framework should lay down the cyber-laws for the nation
and also spell out the punishments for such crimes. Laying down cyber laws is just the
beginning. Governments will have to develop an efficient cyber-surveillance system for
‘policing the information highway’.

### 4. Resource Drainers

Many governments around the world have not been able to leverage ICT to the maximum
because they have not taken into account the “resource drainers” which limit the benefits of
ICT. In planning an e-government strategy, governments should be wary of these resource
drainers the lack of which wastes the ICT implementation efforts in the country. The policy
makers should be aware of these possible pitfalls and work out ways in their plan which takes
care of these possible “resource drainers”:

- **Lack of Citizen Orientation:** Initial initiatives on e-government have been to automate the
  existing systems so as to make procedures within the government technology oriented.
  Government agencies typically evaluate their IT systems according to how well they serve
  the agency's processes and needs—not how well they respond to citizens' needs. The e-
government initiatives should be oriented towards the needs of the citizens and businesses, to
serve their purpose usefully.

- **Lack of Integration:** Government agencies generally buy systems in isolation that address
  their internal needs. Rarely are these systems interoperable across ministries and other
government agencies. This leads to a serious technological problem of integration of these
systems to provide single point of delivery to the citizens. Standardization of systems across
the agencies will help in avoiding wastage of resources and will allow the development of a
seamless e-government.
Lack of training: The implementers of e-government initiatives have a resistance to change from the existing legacy systems. This comes from primarily two reasons, namely, “technological apprehension” and “technological shyness”. Technological apprehension implies the fear that implementation of new systems will undermine their current position and will result in a loss of prestige, power and control while technological shyness implies fear of the technology itself. This perceived conflict between the personal and organizational goals by the introduction of IT in government organizations can be tackled by systematic training of its personnel.

Lack of value orientation: Any e-government initiative entails investment of a substantial amount of resources. Governments have limited resources and the most vital decision is to prioritize the investment of these resources. The initiatives that have the greatest value to citizens as well as government should have the maximum priority followed by those initiatives, which have value for the citizens alone.

5. Implications And Conclusion

In spite of the anticipated benefits, most of the e-government initiatives around the world have been sporadic and unplanned. The driving force behind the spread of ICT in government has been a “technological initiative” rather than a “citizen orientation”. Studies on e-government have mostly focused on the application of ICT to legacy governmental systems and procedures so as to automate (computerize) them. In this paper, we view e-government as an opportunity to “re-engineer” the “non value adding systems, procedures and processes”. The basic premise of e-government should be to provide enhanced service and convenience to citizens, businesses and governments. This paper puts forth an actionable, comprehensive e-government transformation framework enunciating the “milestones” which governments achieve contingent upon the presence of “enablers”. Each milestone builds on the previous milestone, thereby expanding the range of activities that the government undertakes in the evolution towards e-government. The framework also shows that an important initial milestone for the evolution towards e-government is computerizing its internal operations. The use of ICT within the government sets the stage for the achievement of later milestones in terms of using ICT to streamline information flow, service flow and money flow electronically. The framework also shows the logical and intuitive progression towards greater integration, communication and collaboration among the government and other parties.

This framework can serve as a guide not only to the governments around the globe undertaking e-government transformation but will also serve as a useful tool to governments which are contemplating such a transformation. The development of “enablers” is a prerequisite for governments to move from one milestone to the next. Hence governments should explore ways and means for providing an “enabling environment” conducive to the success of e-government. Conscious and proactive efforts must therefore be undertaken to cultivate the various enablers of e-government. This paper also explores the typical “resource drainers” which governments should consider while undertaking e-government initiatives. The knowledge of these “resource drainers” is important for governments to use their resources prudently for “value adding initiatives”. In a typical scenario of limited resources, it is essential for governments to prioritize resource allocation among the umpteen number of tentative e-government plans. Some developing countries have found novel methods of overcoming their “resource and knowledge constraints”. For example, the advent of mobile technology has created more options for developing countries with underdeveloped telecommunications infrastructure. Hence e-government should not be viewed as a prerogative of the developed countries only; instead it should be used as a “vehicle for
development” for all nations. This will help them enhance their citizen welfare as well as business productivity.

6. References