



## The role of process evolution in achieving citizen centered e-government

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# The Role of Process Evolution in Achieving Citizen Centered e-Government

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## **Abstract**

*The growth and popularity of e-commerce has both challenged and enabled public sector organizations to redefine their levels of service. In the late 1990's E-government provided unparalleled opportunities for governments to streamline processes and improve customer service. As a result, achieving successful citizen centric e-government has become a key concern for many governments. Given the unique characteristics of public sector organizations it is argued in this paper that the evolutionary based development of business process change is appropriate to expanding the use of e-commerce technology. This is due to the fact that cultural acceptance of the technology and its implementation is a critical success factor in public sector organizations due to their individual departmental structures. This paper analyses the Irish Government's evolutionary path to the provision of successful e-Government. The lessons learnt from this case provide a valuable insight into a possible roadmap for the successful attainment of citizen-centered e-government in other jurisdictions.*

*Keywords: e-government, process change, portal, Ireland.*

## **Introduction**

Competitive pressures and improvements in information technology constantly force organizations to re-evaluate their business strategies (Porter, 2001; Venkatraman, 1994). Although public sector organizations may not operate in a competitive environment, changes in management philosophies are causing public sector organizations to think and act more like private sector organizations (Gulledge & Sommers, 2002). Electronic commerce is one means by which governments can offer more effective and efficient services (Layne & Lee, 2001).

This paper investigates the evolution of e-Government in Ireland – the leading country in online government service provision within the European Union (Wauters, 2002). Ireland had an overall rating of 85% of public services online, compared to a European average of 55% (Wauters, 2002). A case study is presented detailing how the Irish Government's e-government strategy was devised and implemented. The success of this implementation yields valuable insights into the identification and management of critical concerns during the evolution and attainment of business process redesign in e-government. Cumulatively, these lessons provide a roadmap for the successful attainment of citizen centric e-government. Specifically, the case details how in excess of 50 government authorities, both local and central, were brought together in order to provide a single point of access to government services.

## **Electronic Government**

Electronic commerce can be defined as the use of the Internet to conduct commercial transactions (Mahadevan, 2000). Today, governments are using the Internet to provide public services to their citizens (Gouscos, Georgiadis, Martakos, & Stamoulis, 2001; Watson & Mundy, 2001). In so doing, governments aim to form better relationships with businesses and citizens by providing more efficient and effective services (Al-Kibisi, de Boer, Mourshed, & Rea, 2001; Layne & Lee, 2001; Warkentin, Gefen, Pavlou, & Rose, 2002).

Electronic government consists of using technology, particularly the Internet, as a means to deliver services to citizens, businesses and other entities (Tambouris, 2001; Watson & Mundy, 2001) with the purpose of providing convenient access to government information and services (Brannen, 2001; Gefen, Pavlou, Warkentin, & Rose, 2002). E-

government has the potential to transform not only the way in which most public services are delivered but also the fundamental relationship between government and citizen (Burn & Robbins, 2001; Watson & Mundy, 2001). Operational benefits of e-government, include continuous availability of service, a reduction in response time and a reduction in error rates (Al-Kibisi et al., 2001; Gouscos et al., 2001). These factors contribute to an increase in the efficiency of government (Coulthard & Castleman, 2001; Dearstyne, 2001; Lagroue, 2002).

Through the use of electronic commerce technologies, organizations are challenged to redesign their processes in order to achieve the benefits of increased efficiencies, cost reductions, and better customer service (Glasse, 2001; Warkentin et al., 2002). Governments can also use e-commerce to improve core business processes (Coulthard & Castleman, 2001; Lloyd, 2002; McAdam & Donaghy, 1999).

## **Business Process Redesign**

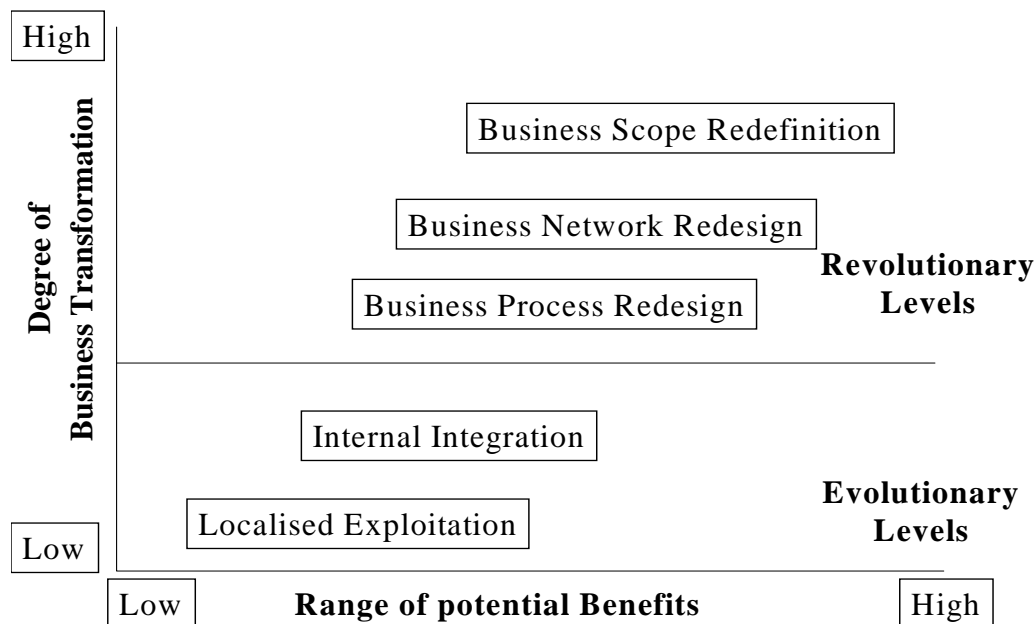
Organizations are required to produce at a low cost, with high quality and with fast and flexible responsiveness to customer needs (Venkatraman, 1994). This puts pressure on organizations to redesign the way in which they conduct their business and build information systems to support new processes (Venkatraman, 1994). Out of such pressures was born the idea of Business Process Re-engineering (BPR) (Davenport & Short, 1990; Hammer, 1990). Davenport and Short equated BPR with the 'new industrial engineering' in which IT capabilities would play a crucial role. The key aspect of BPR is the fundamental and radical redesign of business processes to achieve dramatic improvements (Hammer & Champy, 1993). While BPR promised radical change the attainment of true BPR remained illusive for most organizations, with 50-70% of BPR projects failing (Nissen, 1998). The reasons for these failures can be summarised into two categories: the lack of understanding of BPR and the inability to perform BPR (Chan & Choi, 1997). Yet there is still a need for process change (Nissen, 1998). The lessons learnt from the BPR era served to inform management that less radical, more holistic and more incremental changes to business processes were required (Guha & Grover, 1997).

Venkatraman (1994) identified five levels of IT-enabled business transformation. The central thesis of Venkatraman's work is that only marginal benefits will accrue from superimposing IT on existing organizational conditions (Venkatraman, 1994). This was largely the case in the 1970's and 1980's when IT was primarily used to automate existing organizational processes. This is illustrated by the first two levels of Venkatraman's model (figure 1) i.e.

localized exploitation and internal integration. These levels, according to Venkatraman, are evolutionary, as they require only minimal changes to the business processes.

The top three levels are revolutionary, as these levels require radical change to existing business processes. An organization could redesign its processes and then go on to redesign its network stretching beyond the organization and ultimately redefine the scope of the organization. Venkatraman stated that it was possible for an organization to start at either the top or the bottom of the framework.

**Figure 1 Alternative Approaches to BPR (Source: Venkatraman 1994)**



The organization moving up the framework is seeking efficiency. Initially, this begins with localized exploitation and then moves up to internal integration. As the organization moves up each level the range of potential benefits increases. However, each higher stage requires a greater degree of organizational change. Eventually, in order for the organization to achieve more dramatic results, it will need to move up to the first revolutionary level and engage in Business Process Reengineering. A similar evolutionary/revolutionary model for the creation of e-government is proposed by Layne &

Lee (2001). They identify four stages of evolution in e-government: catalogue, transaction, vertical integration and horizontal integration.

## **Research Methodology**

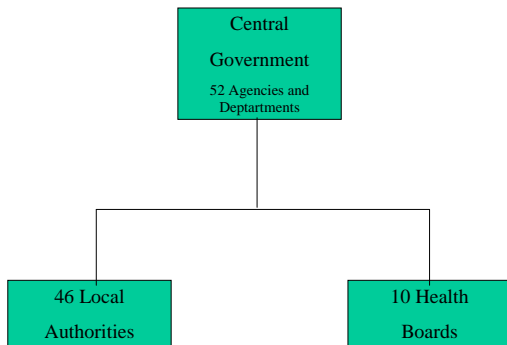
This research is exploratory in nature and seeks to investigate the extent to which Business Process Redesign was instrumental in the movement to e-government in Ireland. The Venkatraman (1994) model of IT enabled change was adopted as a framework for the research. Five in depth interviews were conducted with three government agencies involved in the e-government project. An in depth interview was conducted with one senior civil servant from the Department of An Taoiseach (Prime Minister), the governmental department providing strategic leadership to e-Government initiatives in Ireland. Two in depth interviews were conducted with members of REACH - the executive body created specifically to implement the e-government strategy. In addition, further interviews were conducted with two senior members of the Local Government Computer Supply Board (LGCSB), a public sector company providing IS services to local government.

These interviews were conducted onsite in April 2002. The interviews conducted with the LGCSB were supported by a demonstration of the technology while the interviews conducted in the Department of An Taoiseach and the REACH agency were supplemented by access to internal documentation. Records were kept of the content of all interviews. Further clarifications and updates were obtained by email and telephone contact.

## **Government in Ireland**

Government in Ireland is conducted at two tiers: national and local levels as depicted in figure 2. Central government consists of 17 government departments and 35 agencies such as the revenue commissioners and the court service. Local government consists of local authorities primarily County Councils or City Councils, with 46 currently in operation, who are responsible for the provision of a variety of government services at a local level and 10 Health Boards who are responsible for administering health services.

**Figure 2: Structure of Government in Ireland**



## IS Support for Government

IS support at both central and local level is provided through a combination of in house expertise and outsourcing to the private sector. An alternative outsourcing arrangement is also available through LGCSB. LGCSB is a public sector company whose objective is to provide local authorities with IS systems and expertise on an individual basis. The basic premise is that expertise gained in one local authority can be passed on to others. An example of such service provision is the Complete Information System for Water Services led initially by one local authority. This system was subsequently installed in all local authorities by July 2000.

In response to local authority requests, LGCSB developed electronic forms (e-forms) for use on local authority web sites. These forms were web versions of the traditional paper based form. Users could register with their local authority but there was no online system in place either to process the form electronically or to authenticate the individual. These initial e-forms served only to promote the accessibility of public service forms through an electronic medium.

## Road Map for E-Government

The overall strategy and corresponding implementations of the Irish Governments e-Government initiative are presented in table 1.

Year	Strategy Formulation	Implementation
1999	First Government Action Plan for the implementation of the Information Society. Outlines an integrated approach to the online delivery of public services.	
2000	REACH agency established. Mandated to	OASIS and BASIS projects

	develop and implement a strategy for e-Government. Public Services Broker (PSB) Framework agreed for the integrated delivery of public services, accessible from a single point.	launched e-Forms available on local authority web sites
2001/2002	Second Government Action Plan: New Connections. Objectives: radical improvement in quality of service and to establish Ireland as an exemplar of international best practice The PSB endorsed and prioritized.	REACH in conjunction with LGCSB develop and launch reachservices an interim PSB <a href="http://www.reachservices.ie">www.reachservices.ie</a>
2002/2003	Technical specifications of PSB finalized. Implementation strategies devised.	Reachservices maintained and enhanced Open tendering process for the construction of the PSB. Vendor Selected
2005		Full installation of PSB

**Table 1 Strategy and Implementation Process**

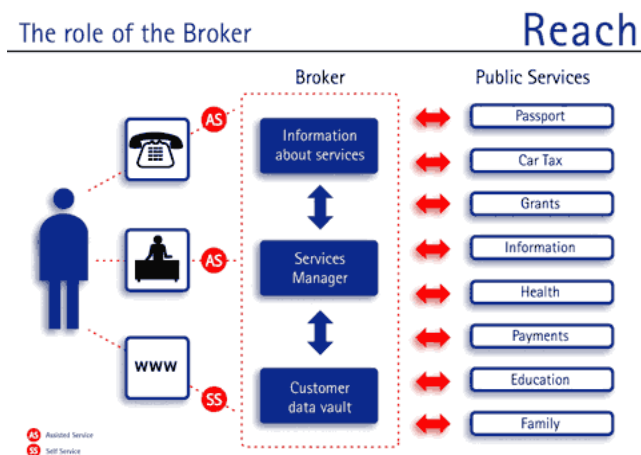
In January 1999, the Irish Government released its first action plan on the Information Society. The plan outlined a three-strand approach to online delivery of public services: information services, interactive services and integrated services. The plan spearheaded the drive to make better use of the Internet for information dissemination. Government departments were required to implement web sites and the OASIS (online access to services information and support) and BASIS (business access to state information and support) projects were initiated. These web sites were to be designed to meet the entire informational needs of a client regardless of the source of the information. The action plan also introduced the initial concept of a portal as the possible architecture of a public service access interface.

Towards the end of 2000 the REACH agency was officially established, its name reflecting the concept of government reaching out to its customers. REACH is an executive body with the responsibility of coordinating the central agencies responsible for implementing the e-government strategy and to provide management of the overall e-government initiative. Initially REACH was composed of 11 members, all civil servants who were drawn from a variety of departments, and was established as an independent unit within the Department of Social and Family Affairs reporting to the Department of An Taoiseach. The concept of a portal based Public Service Broker (PSB) was adopted by REACH as the central mechanism for delivering the e-government agenda.

The framework for the PSB, as depicted in figure 3, can be broken down into three key features: integration, multiple access channels and data security. Firstly, the PSB will provide a single point of access to all services of both central and local government. The revolutionary aspect of the PSB is that service is to be provided from the customer's perspective. That is, the customer interacts with the broker and not the actual service provider. Thus allowing for fully integrated

services regardless of whether the provider is a local authority or central government or both. Secondly, the PSB will make services available through many access channels; these include online self-service, assisted service through telephone contact centers and one-stop shops. Finally, the PSB will provide a customer data vault which will store data relevant to their interaction with the Government. This data will be used to facilitate online transactions, provide personalization of the user interface and various other aids in form completion. The individual user will have authority over their personal data and may specify which departments may access what information. Thus the provision of non-basic data will be voluntary and determined by the level of interaction that the user wishes to have. For example, the storage of personal identity photographs will be voluntary however; if an individual intends to apply for a driver's license using the PSB they will have to allow the system to hold their photograph.

**Figure 3: The Public Service Broker, Source: REACH internal documentation**



## Implementing e-Government

In November 2000, as an initial step in the move towards e-government, the OASIS ([www.oasis.gov.ie](http://www.oasis.gov.ie)) and BASIS ([www.basis.ie](http://www.basis.ie)) web sites were launched. These web sites provide detailed information on government services to citizens and businesses respectively. With a focus on customer requirements these sites broke the long-standing tradition of distributing government information along functional lines.

During 2001, REACH, in partnership with LGCSB, developed an interim level PSB. LGCSB was identified as a technical partner for two reasons; first LGCSB had gained significant expertise through the implementation of e-forms and second local authorities had a tried and trusted relationship established with LGCSB. This interim service became known as reachservices and was officially launched in April 2002.

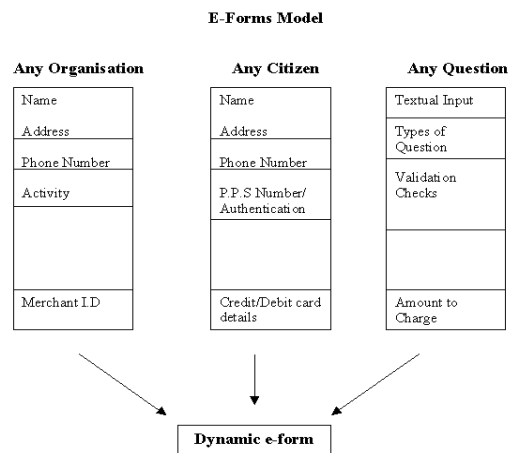
Also in April 2002, the second government action plan entitled 'New Connections' was published. The main objectives of the e-government strategy were outlined as: a radical improvement in quality of service to customers; major improvements in administrative efficiencies; enhanced control of fraud and abuse of publicly funded services and finally to establish Ireland as an exemplar of international best practice. The government also made a commitment to have all public services capable of electronic delivery available through a single point of contact by 2005.

## **Meeting the Challenge of Delivery**

The main challenge in the development of reachservices was to have every local authority paper based form available online for electronic download and submission. Each of the 46 local authorities had at least 133 forms that they required to be individually customizable. This resulted in a total requirement of in excess of 5,000 forms, excluding the health boards. To meet this requirement, LGCSB developed a centrally administered system that would allow each local authority access to an electronic form builder.

The form builder tool has a graphical user interface and is based on the idea that a generic form can accommodate any organization for any citizen and cover any question. Figure 4 presents a representation of the form builder application. The form builder is based on three basic entities: the organization, the individual and the question. It enables the local authority to create their customized form that is then uploaded onto the reachservices site.

**Figure 4: Representation of Form Builder Application; Source LGCSB internal documentation**



Central to the progression of the online service provision achieved by REACH was the redevelopment of e-forms into the form builder tool accessible to the local authority through the portal reachservices. The local authorities are allocated a username and password allowing them access to the form builder. Each local authority administrator can then select which e-forms are to be made available for their authority and can customize or edit those forms online. From a template form the administrator creates the questions, defines what type of response the user will give and can add whatever validation checks or mandatory fields that are required. The administrator can also remove forms for their local authority if necessary.

Another significant advance achieved by reachservices is citizen identification. Before using the system, the individual must register with reachservices. Part of this registration is an authentication process that is managed by the Department of Social and Family Affairs. The individual may then access the reachservices site using their Personal Public Service (Social Security) number and password. This is an essential feature of the process, as it provides the authority with proof of the individual's identity and enables features like intelligent form filling.

Intelligent form filling allows certain fields to be populated automatically based on the information stored on each citizen. It also allows for certain questions to be deactivated when they are not necessary. The user is also provided with the capability to save a partially completed form for completion at a later date. Visual aids are provided as means of indicating to the user which pages of a form have been fully or partially completed. When the user submits the form it is automatically routed to the relevant authority in XML format. At present the front-end interface is fully automated while

the back end system still relies on human interaction. Typically when a form is received it is printed off to a hard copy and processed manually in the same way as the traditional method.

## **Future Developments**

The central e-government strategy is to implement a Public Service Broker by 2005. This broker will facilitate multiple access modes, including telephone access and one-stop shops, to all government services. Under this model the underlying structure and departments of central government will become less relevant to the citizen as all services will be provided in an integrated manner through the public service broker. The construction of the PSB has been outsourced and is currently under development. When complete it will act as a single point of contact to the customer by integrating services around predefined life or business events, instead of presenting services around functional departments. The fully functional PSB will also be known as reachservices and from the user's perspective there will be a seamless transition from the initial service offering to the more sophisticated PSB.

## **Findings**

E-government strategy was devised and ratified by the highest possible level of central government and an independent agency established to implement this strategy. The independent agency – REACH, identified and exploited the technological expertise of LGCSB and also successfully procured a partnership with the Department of Social and Family Affairs in order to provide an authentication service. The effective management and coordination of otherwise autonomous stakeholders, combined with the right technical infrastructure, and cross-departmental collaboration and integration provided the ingredients for the provision of a successful public e-service.

Localized exploitation can be achieved by directing all authorities to implement individual web sites. This encourages the authority to become web proficient and potentially lowers later barriers to centralized web development. At this stage, the development of customer focused web sites, independent from the local authorities, as authoritative repositories of government information promotes a shift in focus from departmental orientation to customer need.

Internal integration can be achieved by implementing a portal strategy that provides form building, database and authentication services to the participating authorities. However, providing a centralized service can create tension between central and local government. In this case, potential tension was managed by ensuring that the authority

previously responsible for the service remained responsible and furthermore that the responsibility was made clearly visible within the portal by allowing customized forms. Customizable forms combined with the usability of the form builder and the existing relationships between LGCSB and the local authorities greatly impacted on the rate of buy-in by the local authorities.

Throughout these stages, providing an easy to use system that is focused on the citizens' needs encourages citizen usage. Evidence from the case, in relation to registration rates, indicates that allowing the citizen some control over personal data and the use of that data, helps to appease fears relating to centralized data storage.

Business process redesign has not yet been achieved however, preparations are well underway and initial lessons can be drawn at this point. This case provides evidence of the existence of the gap identified by Venkatraman (1994) between the evolutionary and revolutionary means of business transformation. The successful attainment of business process redesign requires a sophisticated infrastructure – one that cannot be attained by evolving from existing systems. However, the design and functionality of this infrastructure can be informed by the experience gained in the earlier stages. The scale of the project at this stage will necessitate very detailed requirements specification and outsourcing of the development.

## **Discussion**

The immediate impact to citizens can be judged in terms of ease of access, ease of use and efficiency. Providing a multitude of forms from individual authorities in one location gives citizens ease of access resulting in timesavings. The completion of a form is greatly simplified through intelligent form filling. In addition, the submission process is simplified as it removes the need for postage or travel to the local authority thus expediting the delivery of the service. The reachservices web site went live in mid April 2002 and was launched without the use of advertising in order to prevent an initial surge of activity. Nonetheless, the initial uptake rate was approximately 500-600 registrations per month during its first few months of operation. This volume of traffic was regarded as successful due to the subdued launch and the fact that the site only offered a fraction of the functionality ultimately intended.

Reachservices has had a 100% uptake rate by local authorities, albeit some authorities are implementing at different levels. This should be viewed in the context that the Local Authorities have not been mandated to participate in the reachservices project. There has also been a very high percentage take up rate amongst the health boards.

Table 2 compares the achievements in this case with the (Venkatraman, 1994)framework.

Year	Strategy Formulation	Implementation	Stage of Evolution
1999	First Government Action Plan for the implementation of the Information Society. Outlines an integrated approach to the online delivery of public services.		
2000	REACH agency established. Mandated to develop and implement a strategy for e-Government. Public Services Broker (PSB) Framework agreed for the integrated delivery of public services, accessible from a single point.	OASIS and BASIS projects launched  e-Forms available on local authority web sites	Local Exploitation
2001/2002	Second Government Action Plan: New Connections. Objectives: radical improvement in quality of service and to establish Ireland as an exemplar of international best. The PSB endorsed and prioritized.	REACH in conjunction with LGCSB develop and launch reachservices, an interim PSB  <a href="http://www.reachservices.ie">www.reachservices.ie</a>	Internal Integration
2002/2003	Technical specifications of PSB finalized. Implementation strategies devised.	Reachservices maintained and enhanced Open tendering process for the construction of the PSB. Vendor Selected	Business Process Redesign
2005		Full installation of PSB	Business Process Redesign

**Table 2 Strategy and Implementation Process Compared to Evolutionary Framework**

The development of local authority web sites and later the OASIS and BASIS were the first attempt by government agencies to use e-commerce technologies to provide e-government. The usage was initiated and maintained at the level of the individual department or agency and as such represents a local exploitation (Venkatraman, 1994) of e-commerce technologies. While the use of the technology was at an individual local level, the OASIS and BASIS web sites, and the e-forms, represent the first evidence of a clear shift towards a customer-focused orientation. Internal integration (Venkatraman, 1994), was attained by the implementation of reachservices. This e-commerce portal connects local and central systems through the use of a centralized database that maintains the authenticated data of the individual citizen. While reachservices provides a centralized portal for citizens it does not provide the functionally to facilitate true citizen centric e-government. In order to create this level of e-government a completely new system based on the PSB concept

is required. To achieve this goal a revised development strategy was decided upon which directed the operations from a more strategic level. Venkatraman (1994) defines these two alternative viewpoints as evolutionary and revolutionary. In order to achieve business process redesign it was necessary to pursue a development strategy that broke with the evolutionary strategy. Full integration of the disparate elements of government will only be achieved through the launch of the full public service broker and will result in a system that is citizen centric rather than government centric.

## **Limitations and Further Research**

One of the main restrictions the authors have experienced in researching e-government is the level of access to the users of e-government services. Although the data obtained from senior government personnel is useful in exploring the development of strategy for e-government, it could potentially be subject to responsibility or accountability biases. However, due to data protection legislation and other privacy issues, the possibility of surveying users has been limited. The opportunity to gather user data would however offer the potential to explore further research areas, especially in the process of pursuing a development strategy to support the full implementation of e-government.

## **Conclusion**

This case provides valuable insights into how citizen centered e-government can be attained through business process change. The model of business transformation proposed by Venkatraman (1994) represents very well the process as it actually occurred in this case. In order to move from an evolutionary to revolutionary business transformation a requirement to abandon existing systems in favor of new systems has been identified. The ability to identify and scope these new systems was in large part facilitated by the learning that occurred while developing the initial e-government systems – the evolutionary stages. In addition, the establishment of a specific government entity - REACH - whose sole purpose is to oversee and implement the e-government strategy has contributed greatly to the success achieved to date. REACH was in a position to both identify and manage the critical success factors involved in delivering e-government. First, the most appropriate model and technical infrastructure were identified and implemented by outsourcing to leverage expertise that already existed. This use of existing expertise proved highly successful in terms of developing a robust infrastructure within a limited timeframe. Second, critical concerns of local authorities were managed by using familiar actors. Third, the interactions necessary between otherwise independent agencies was successfully coordinated

to ensure the delivery of a quality service. Fourth, the maintenance of a customer focus by providing a quality service through a single portal in which the citizen has control over their personal data contributed to a successful uptake of the system.

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