Reengineering bureaucracy for effective e-governance

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Abstract

E-Government initiatives have been around for quite a while in developed and developing countries. The benefits of computerizing existing bureaucratic systems have been well researched. However, literature on how information technology can improve user experience with bureaucratic systems by disintermediation is comparatively sparse. Usable knowledge can be harnessed more effectively and efficiently by automated systems to yield better alternatives to decision makers. The benefits of network form of bureaucracy as opposed to hierarchical form are analyzed in this paper, We also study those features of e-governance that go beyond automating citizen-government interactions. We discuss how reengineering the bureaucracy can improve the effective and efficient e-governance regarding citizen-centric decisions.

Keywords: bureaucracy, e-governance, network structure, business process reengineering

Introduction

The nature and quality of government-to-constituent transactions all over the world have been dramatically influenced by recent innovations in information technology (IT). E-Government initiatives have been around for quite a while in developed and developing countries. The benefits of computerizing existing bureaucratic systems have been well researched. However the underlying structural, organizational and institutional components upon which technological innovation is superimposed are as widely divergent as the cultures from which they derive. As a result, the successes of such implementations are widely divergent, and the means by which their effectiveness can be assessed are as of yet in nascent form. Electronic government (e-government) can be defined as the use of information and communication technologies (ICT) by government to deliver information and services to its constituents. Gronlund (2005) states that while government organizations have succeeded in achieving more efficient operations and better services at the national level, progress is slow to emerge at the local level. In spite of the considerable literature on digital or e-government, there is no general agreement on good measures for digital government or what we should be measuring (Carbo, 2004). Usable knowledge can be harnessed more effectively and efficiently by automated systems to yield better alternatives to decision makers. In this paper, we study those features of e-governance that go beyond automating citizen-government interactions. We analyse how reengineering the bureaucracy can improve the effectiveness of e-governance regarding citizen-centric decisions.

Some studies have focused on availability, cost, and quality of ICT networks and equipment. Another stream of research looks at digital government as a special case of ICT-enabled business process change (Scholl, 2003). Factors such as societal readiness for e-government have also to be taken into account in tandem with countless assessments of e-readiness as undertaken by various international organizations specialized in "ICT for development" work (Moon, 2005). In addition to the above, a clearer understanding of the organizational and structural changes that precede the transformation to e-governance is necessary;

such analysis is heretofore largely lacking. With this as a main objective, we take a bottom-up approach and analyse the actual transactions that occur between entities in an e-governance context.

Much has been written about the potential of information technology to 'revolutionize' society, particularly in the context of their role as catalysts of the 'Information Revolution'. This 'revolution' is often juxtaposed with its predecessor, the Industrial Revolution, usually for the purpose accentuating the idea that communication networks are as integral to the process of development as was the birth and development of industry in the 19th century. While it is the question of access that has risen to the forefront of development agendas in the context of the digital exclusion, much work remains to be done in analyzing and understanding how these technologies are utilized and *applied* to bring about expected revolutionary societal and economic changes and improvements. An equally important point to be considered is the influence of information technology on transforming bureaucracy.

The term 'e-government' refers to the application of Information and Communication Technology (ICT) by government agencies In this paper, we prefer to use the term "e-governance" in a broader sense to include a deeper understanding of the way ICTs impact the existing (and potential future) interactions between a government and its constituents. In other words, e-governance goes beyond the 'what' of an e-government interaction that presumably delivers service to a constituent - and includes rather an analysis of the 'how' and 'why'.

Sometimes the terms 'digitization' and 'digitalization' are used interchangeably. But there is a critical difference between the two. Digitization describes the pure analog-to-digital conversion of existing data and documents. Digitalization moves beyond digitization, leveraging digital information technology to entirely transform a business' processes — evaluating, reengineering and reimagining the way you do business. In the context of digital government, digitization refers to make the government documents easily available to citizens by appropriate automating of citizen to government interactions. There is a considerable amount of literature on this topic. Digitalization goes further and seeks to leverage innovations in digital information technology to improve and reengineer the process digital government.

This paper is organized as follows. First, we present a brief summary of research regarding how information technology has influenced bureaucracy in this digital age. Next, we propose a holistic framework for improving bureaucracy that will yield more effective e-governance. Research findings and summary form the last section.

Research Background

Bureaucracy, as it is understood nowadays, emerged in western society during the second half of the nineteenth century. According to Max Weber, in this new type of organization, leadership and authority were derived from a more rational framework than was the case before (Waters, 2015). Previously, authority was derived from either charisma or tradition. In the case of charismatic authority, followers obeyed gifted leaders out of devotion, loyalty and respect. Traditional authority existed due to historical reasons and people obeyed a person in power for the simple reason that the person was in a position of traditional power. Weber believed that authority in the new, bureaucratic organizational form was more rational because leaders were recognized and obeyed for subscribing to values of logic, efficiency, and reason (Jain, 2004). Max Weber's bureaucratic approach worked as a solution to problems of traditional administrative systems. But it was not the perfect or "close to perfect" solution.

As stated by Waters (2015), Max Weber formulated these six principles of the bureaucratic management approach.

● Proper Division of Labor
Division of labor specialization should be fixed and there should be a balance between power and responsibilities.
● Chain of Command
The chain of command or organizational hierarchy should be constructed in such a way that information related to decisions and works can flow effectively from top to bottom.
● Separation of personal and official property
Owners and organization's assets are separate and can to be treated as same by the owner or the organization.
● Application of Consistent and Complete Rules
There should be proper rules and regulations in the organization for running the organization. These rules should be followed in every step of the organization and they are equally applicable to every member of the organization.
● Selection and Promotion Based on Qualifications
The selection and promotion of workers should be based on; skills, experience, age. It should not be influenced by personal relations and benefits.
● Training in job requirements and skills
There is a difference between management and other parts of organization and training and improving skills of management is important.

Some of the shortcomings of the bureaucratic management approach are listed below (Waters, 2015).
● The emphasis is only on rules and regulations. There will be unnecessary delays in decision-making due to formalities and rules of Bureaucratic Organization. Coordination and communication hampered because of too much formality and rules.
● Bureaucracy involves a lot of paperwork and has just too much level of authority which results in a lot of wastage of time, effort and money. Not ideal for efficiency.
● Too much importance is given to the technical qualifications of the employees for promotion and transfers. Dedication and commitment of the employee are not considered.
● The rules and levels of authority are just too much. It gives a greater sense of security to the employees. But bureaucratic management gives a window for "red-tapism."

E-government has addressed some of the weaknesses of bureaucracy. Improvements have been achieved in the following areas (Cucciniello, 2012):
● Better access to information,
● Better access to government services,
● Better customer service,
● Better value derived from government services.

Some of the deficiencies of bureaucracy that have not been fully addressed by e-government initiatives pertain to the quality of decisions made by the government that affect the general public. Decisions made by government departments at federal state, and local levels affect all citizens. Some of these decisions can be quite complex. For example, consider a situation in which a new renewable generation facility is needed for a region. Many people may want the facility near their area with the expectation that it will bring jobs and economic growth to their area. Others may not want it near them because of concerns about environmental impacts and increased traffic (Morgan, 2019). There can be conflict between local and statewide goals. In such situations, optimal decisions have to be taken using techniques such as multiple criteria decision making.

Bureaucracy as a means of implementing public administration is undergoing momentous changes due to innovations in Information and Communication Technologies (ICTs). These changes have to be examined with reference to political, managerial, and professional domains responsible for policy, administration, and service (Cordella, 2007). Typically, in a bureaucracy, discretion is structured by rules and standard operating procedures, and it does allow civil servants to take into consideration contextual variations and act according to other norms. It has to be ensured that the uniquely human ability to act on broader societal norms is retained after ICT intervention in bureaucratic practices.

The interactions between information technology (IT) and organizations in general can also be studied in four stages as stated by Hurbean (2008). In the first stage called 'Islands of Automation,' organizations continue to function as before having just automated a small fraction of their processes. In the second stage called 'Automated Process Chains,' organizations produce the same services as before but with changes in the way the organization functions, with a minimum of reengineering due to the intervention of information technology. In the third stage, termed as 'Reengineering through Information Technology.' organizations produce the same services as before but in a completely innovative way that affects all internal functions information flows and structures. The fourth stage is called 'Total Reinvention.' In this stage, we envisage a scenario where organizations restructure the meaning of their existence and all their internal and external relations.

A Framework for Reengineering Bureaucracy

Information technology (IT) can play a critical role in improving bureaucracy resulting in better user experience. Automating existing bureaucratic procedures *per se* will not yield the expected results. As Michael Hammer, a well-known business consultant who championed business process reengineering, wrote an article in *Harvard Business Review* titled "Don't Automate, Obliterate." He stresses the importance of simplifying processes, eliminating non-value added tasks, and innovating to improve speed, quality, and service. No meaningful improvements can be expected by simply automating the existing inefficient processes.

In this section, we propose a framework to improve bureaucracy. This framework consists of five stages. In the first stage, existing government-constituent interactions are examined. The number of interactions is indeed very large as evidenced by the three stakeholder groups of constituents (citizen, business, and government). In the second stage, processes are made free from accountability dysfunctions. In the third stage, processes are restructured to make them more effective and efficient. In the fourth stage, the hierarchical structure is converted into a network structure. In the fifth and final stage, restructured interactions (processes) are automated in the modules of the networked bureaucracy

Stage I

In the first stage, we select the processes that need to be reengineered so that the citizen will have a better interaction with the government. In order to reengineer bureaucracy, we need to address these questions (Ramaswamy and Selian, 2007):
● How can we make e-Government truly citizen-centric?
● Do we have objectives that are correct and realistic?
● How well are we achieving these objectives fully and cost effectively?
● Are these objectives jointly determined and agreed upon by the citizens and the government agencies?
We need better models of the processes used to plan, fund, develop, implement, operate, and evaluate successful e-Government in various political and social, cultural, and economic contexts (Allison, 2002).

Some of the above concerns are addressed by the e-Governance cube. Ramaswamy and Selian (2007) propose the formation of an e-Governance cube with the following three axes: *entity type* on the x-axis, *processing complexity* on the y-axis, and *perceived value* on the z-axis. The e-governance cube provides a means of evaluating an extensive (if not comprehensive) series of government-constituent interactions. Depending upon which of the 27 sub-cubes contains the given transaction of interest, we are now able to make inferences on the potential of that transaction for its ease of conversion to e-governance. This naturally opens up a wide arena of analysis, particularly for others who wish to specialize and focus specifically on the dynamics and characteristics of specific e-governance transactions. In the context of the e-governance cube model, the further one moves away from the origin, the more resistance one encounters. From the e-inclusion view point, the processes that are valued high on the z-axis (perceived value) need to be addresses first. At the end of the first stage, we will have a prioritized list of processes that have to be restructured.

Stage II

In the second stage, socio-technical factors are considered. Sociotechnical factors pertain to exacerbated accountability dysfunctions that can occur as a consequence of automation. According to Bovens (2005) the major categories of dysfunctions are: Rule-obsession, Proceduralism, Rigidity, and Scapegoating. Before manual procedures are automated, it has to be ensured that there are no problems such as rule-obsession and proceduralism. Not only will this help towards efficiency and effectiveness, but it will also make acceptance by constituents easier.

Rule-obsession refers to the focus on outcomes over process. This focus on outcomes over process takes the rule–obsession dysfunction and transmutes into an equally dysfunctional outcome-obsession where the outcome of the computer process cannot be questioned (Smith, 2010). 'Proceduralism' refers to increased emphasis on procedures to avoid responsibility and accountability. Strict adherence to procedures can render the bureaucracy to lose the ability to balance procedures with public values. Relying heavily on encoded computer procedures can undermine the effectiveness of public sector organizations. Bureaucracy defines roles and positions with assigned responsibilities and practices, including discretion. As the operating procedures are embedded in the system, they can become more rigid than supervisors could be (Fountain, 2001).

The ability to take contextual variations into account is affected by the encoding of procedures which actually results in encoding rigidity. After developing a system, the embedded rigidity can make it difficult to modify as part of organizational learning. As a result of the introduction of ICTs in the public sector, there has been a displacement of accountability from bureaucrat to software engineer. When things go wrong, the tendency is to use the computer as a scapegoat. It is important to consider these socio-technical factors while building e-government systems in order that the citizens can have confidence in automated systems. At the end of the second stage, we will have a set of modified processes that do not exhibit exacerbated accountability dysfunctions.

Stage III

In the third stage, the selected processes are restructured. Automating legacy procedures that afforded plenty of opportunities for inefficiency will not yield results. At this stage, the results of data analytics are used to modify processes (Passerini, 2012). The main objective of restructuring various processes before transforming them into digital interactions is to improve the effectiveness as a system. It is to be noted that placing an IT layer over and automating a faulty bureaucratic system may yield a more efficient system, but will certainly not be one desired by or responsive to its core constituents.

Business process reengineering (BPR) has now become a well-established approach in the restructuring efforts of public sector organizations. Frederick Taylor suggested in the 1880s that managers use process reengineering methods to discover the best processes for performing work, and these processes be reengineered for optimal performance. Hammer and Champy (1993) define BPR as 'the fundamental rethinking and radical design of business processes to achieve dramatic improvement in critical measures of performance such as cost, quality, service and speed.' Davenport (1993) describes 'business process redesign' as the analysis and design of workflows and processes within and between organizations.

Redesign, retooling, and re-orchestrating form the key components of Business Process Reengineering (BPR) that are essential for an organization to focus on the outcome that it needs to achieve. In the first stage, the focus is on redesigning the processes. At this stage, we have to look at simplifying and standardizing the existing processes. If there is any need for reorganization, it is done at this stage. The metrics to measure the effectiveness of the process is also determined at this stage. In the retooling stage, the available IT infrastructure such as networks, intranets, and extranets is examined. In addition, workflow of the processes is accurately mapped. In the final stage, re-orchestration of the processes is implemented.

The entire technological, human, and organizational dimensions can be changed by using the BPR technique. Information technology plays a major role in business process reengineering as it provides office automation, it allows the business to be conducted in different locations, provides flexibility in manufacturing, permits quicker delivery to customers and supports rapid and paperless transactions (Bogdanoiu, 2014). The concept of 'Business Process Engineering' can be successfully applied to improve the decision-making aspect of bureaucracy, which in turn results in better outcome to citizens. The BPR technique implements organizational change based on rapid change, employee empowerment, and training and support by information technology. In order to implement BPR to public administration, the following key actions need to take place:
● Selection of the strategic processes for redesign,
● Simplify new processes – minimize steps – optimize efficiency – modeling,
● Organize a team of employees for each process,
● Organize the workflow – document transfer and control,
● Assign responsibilities and roles for each process,
● Automate processes using information technology,
● Train the process team to efficiently operate the new process,
● Introduce the redesigned process into the new organizational structure.

Martin (2006) proposes 'One-Stop Government' to improve e-governance. Here, the front-office corresponds to the web portal the citizen accesses. Back-office refers to the database that links with various governmental authorities. In such a setup, BPR can play an important role in both horizontal and vertical integration of processes. Consider a scenario where there are 'm' number of processes in each authority and 'n' number of such authorities. In horizontal integration, the different processes in each authority are redesigned so that inter-departmental communications are seamless. In vertical integration, many authorities participate in the same process. In this way, from the perspective of the citizen there is no fragmentation of workflow even if any request involves multiple processes in different departments.

The need for effective and efficient governance calls for automated systems. But in developing countries, where there is no culture of established bureaucracy, there is also a concomitant need for accommodating socio-cultural factors. An analysis of the existing bureaucratic practices in transition countries indicates two areas that need attention. The first pertains to the availability of information regarding governmental procedures to the general public. Acquiring such information is quite simple in most western societies. But

in some developing countries government officials, especially at the lower levels, make it harder for the public to execute these transactions so their reliance on the officials who "sell" this information and "facilitate" the required transaction is not diminished. The roots of public sector corruption are found in such opportunities. The second area of concern is the convoluted way in which governmental procedures in general are laid out. In many countries, several layers of authority are embedded in the bureaucratic system. Efforts to build a congruous system to replace it have yet to emerge. This gives an opportunity for government officials to use the system to their advantage. Clearly, the simplification and clarification of procedures has not been their priority (Homburg and Bekkers, 2002). This elucidates the point that process restructuring should also accompany a concomitant improvement in the work and incentive conditions of the government employees delivering public service. This necessitates the emergence of an environment in which all participants have a share in the benefits of modern technology.

The need for integrating business processes and systems increases in one-stop governance. The difficulties can be technical, political, or integration-related. Technical difficulties can arise due to the existence of independent systems. Political difficulties refer to the lack of involvement by the authorities. In order to successfully implement both horizontal and vertical integration, the structure of public agencies has to be agile. The existence of many participants in various processes can add to the complexity. At the end of the third stage, we will have all the processes restructured for better efficiency and better effectiveness.

Stage IV

After completion of the restructuring stage, we are ready for implementing in the fourth stage. In this critical stage, we attempt to change the hierarchical structure of bureaucracy to a more agile matrix structure. The importance of networking, coordination, and collaboration among different departments of the government cannot be overemphasized (Centeno, 2005). The network administration has technological and organizational aspects which are closely related. In addition, the interoperability of systems and standardization of systems is only possible if the administrative compartmentalization is changed. In order to successfully execute this stage, the top management support is critical. As Hurbean (2008) suggests, an approach based on enterprise resource planning (ERP) will be helpful. Both horizontal and vertical integrations of processes are made so that the way communications occur both internally and with external entities are integrated.

The traditional bureaucratic model described by Weberian theory emerged with the rise of the industrial society that resulted in the growth and expansion of the administrative tasks of the modern State (Welp, 2007). The main objective of Weberian bureaucracy was to seek efficiency and rationality in executing its functions. It was ensured by unified management and the uniformity and the predictability of routines and processes. This model's rigid hierarchy and the inflexibility of the processes and regulations did not permit the possibility of appropriate responses to the new problems encountered in our current complex environment. The concept of 'New Public Management' was put forward by the Anglo-Saxon countries – United States, United Kingdom, Australia, and New Zealand – as an alternative model to Weberian Bureaucracy (Welp, 2007). This alternative model, referred to as 'New Public Management' (NPM) seeks to create smaller administrative structures that are decentralized and enable a degree of flexibility. Less hierarchical models were sought, with emphasis being placed on efficiency and effectiveness, and on an orientation towards the citizen (Hughes, 2001). NPM seeks to create an entrepreneurial government that puts service providers in competition with each other and displaces control from bureaucracy to the community.

The increasing number of public, private, and social actors and intermediaries at national, regional, and local levels in the implementation of e-Governance indicates the need for a networked e-Governance

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(Centeno, 2005). Governments can create considerable amount of public value just by reproducing themselves as networks. The utility of a network depends on the different systems connected to it and the subsequent interoperability. Interoperability can be defined as the ability of two or more systems to exchange information and to use the information that has been exchanged. Cross-boundary information sharing is dependent on collaborative governance and interoperability. Collaborative governance provides an inter-organizational structure to make decisions and coordinate efforts across organizational boundaries (Gil-Garcia, 2016). In the current type of bureaucracy that is widely practiced today, the structure is still hierarchical. Even though the orientation is essentially administrative, information dissemination is also given importance. Using the web, many forms can be obtained and some transactions can be executed by citizens. The level of decision-making is at top and middle levels. The degree of operational ease is medium and there are few intermediaries between citizens and decision-making authority.

In the networked bureaucracy, the structure will be matrix and the orientation of this bureaucracy is the user. The web services mirror all the services provided in person, by mail, and by telephone. There are no intermediaries and the degree of operational use is high. At the end of the fourth stage, we will have the entire bureaucracy reengineered for optimal utilization.

Stage V

In the fifth and final stage, restructured processes are automated in the modules of the networked bureaucracy. When automated processes result in disintermediation, it is necessary that the relevant entities are on board with new procedures. The degree of automation can vary across a wide range. Smith (2010) introduces a scale of nine degrees of automation starting from the first level where the computer offers no assistance to the ninth level where the computer decides everything. In between these extremes, there are several levels where a varying degree human-computer interaction occurs. The appropriate level of ICT intervention depends on the particular interaction that has to be automated.

Research Findings and Summary

Sangki (2018) suggests a new e-government development model called as "E-Government Maturity Model based on Socio-political Development" that incorporates the level of social maturity based on e-democracy and the maturity level of civic society with statistical model. The new model classifies e-Government development into four stages: "Bureaucratic model", "Information management model", "Participatory model", and "Governance model." In the context of this paper, we are examining the critical factors that affect the transformation to governance model from bureaucratic model. Our proposed model is different from the 'E-Government Maturity Model' (EGMM) in the following way. EGMM takes an incremental approach whereas our model attempts to change bureaucracy in a more comprehensive way. By our stage wise approach, we attempt to restructure the processes as well as reengineer the hierarchical structure into a network structure.

During the last few decades, countries all over the world have attempted to improve the efficiency and effectiveness of their bureaucracies by leveraging information technology. While there has been much success regarding achieving efficiency, there is still a lot of scope regarding the effectiveness aspect. The basic building blocks of e-governance in public sector bureaucracy consist of digitized versions of interactions between the government and its constituents. In this paper, we have discussed various aspects of bureaucracy and e-governance. The importance of decentralizing the decision-making process by horizontal and vertical integration of the various processes that affect citizens has been analyzed. Restructuring the bureaucratic procedures and then automating them in a systematic way as suggested in this paper affords a practical approach to render transparency and accountability to public sector in addition

to making bureaucracies more efficient and effective. Future work in this area focuses on developing a comprehensive framework that will enable policy makers and researchers to point out the potential priority areas that need to be restructured both process wise and integration wise. This will also yield a realistic estimate of resources needed to achieve such transformation. In addition, such an approach will also help in giving a better insight into process restructuring.

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