

# Challenges and Obstacles of e-Government Streamlining: A Case Study

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## ABSTRACT

E-Government streamlining has been a challenge since its inception in the domain of e-business. Business organizations face challenges while trying to collaborate with partners through the use of information technology in order to ensure efficient delivery of services. One of the major reasons for these inefficient services has been political bureaucracies among government organizations. To meet this challenge, a transparent and networked environment is required where government organizations can effectively partner with other relevant organizations. Using a case study analysis, we intend to identify the challenges in government organizations while providing services which require collaborative effort, and the obstacles in adopting new technology for collaboration. We believe that the outcome of our research could provide a generalized guideline for government agencies where there is need for digital collaboration. Our findings will thus help government organizations to address the challenges in digital collaboration, and also help them implement new technology successfully to ensure efficient delivery of services.

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## 1. Introduction

The concept of e-Government evolved from the domain of e-business where organizations have to collaborate electronically through internet and related technologies with customers, suppliers, and other partner organizations for effective delivery of services. The implementation of e-Government could imply different objectives and different levels of transformation. For instance, in USA, the main objective is to automate and integrate different islands of information to simplify and maximize the benefits of technology (Navarra & Cornford, 2003). On the other hand, in Europe, the emphasis is to modernize public services and offer better services to citizens (Cuddy, 2003). Regardless of the primary goal, the effective delivery of e-services requires integration of process and information systems (IS), and coordination of processes between disparate organizations and stakeholders. Historically, bureaucracies associated within government organizations prevent them from delivering effective services (Wilson, 1989). Even after the emergence of e-Government, most bureaucratic processes still involve manual work and have abundant (and redundant) checkpoints. When the stakeholders in a process work as separate entities, each managing or dealing with disconnected silos of knowledge and information, it becomes difficult to render efficient delivery of services. Hence, the first step towards efficient delivery of services is to facilitate a transparent networked environment where governments can truly partner with other government organizations, businesses, citizens, and additional stakeholders (Fan, 2013; GAO, 2003). However, due to political, organizational, and technical reasons there exist challenges in creating such a transparent, collaborative environment in a government organization. In our research we intend to identify such challenges. Consequently, our first research question is:

*What are the challenges in the current government organizations in providing services which require collaborative effort?*

Collaborative, transparent environment is a challenge for business organizations as well (Nath et al., 2009). IT industry leaders have successfully implemented different collaborative technology such as Wiki to address these challenges (Nath, 2012). However, due to the presence of internal obstacles, adopting a new technology and/or tool in a government organization is not easy (Janita and Chong, 2013; Robey et al., 2013). In our research, we intend to identify these obstacles. This leads us to propose our second research question:

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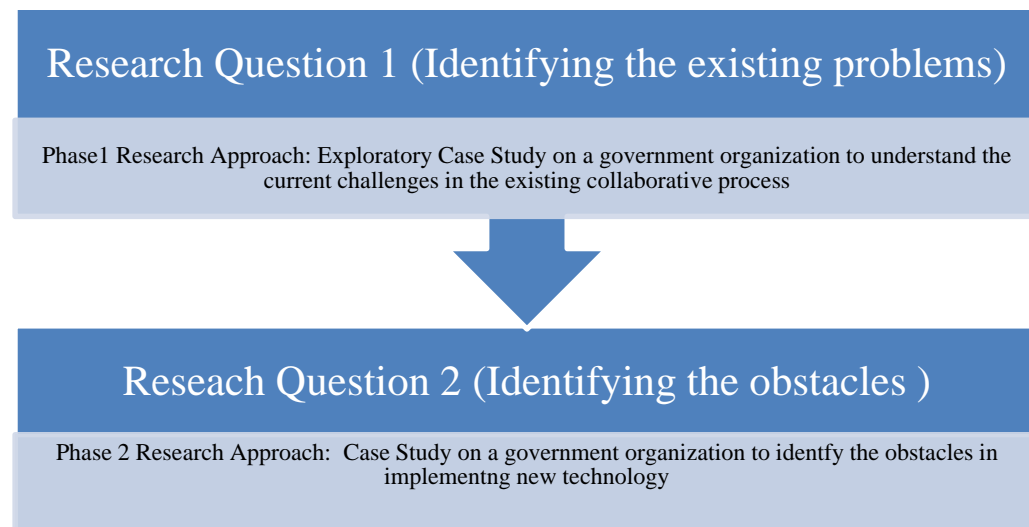
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*What are the obstacles of adopting new technology tool for collaboration in e-Government?*

Guided by the above questions, our research essentially has two major phases. In the first phase, we identify the existing challenges faced by current government organizations while providing services that require collaborative effort. Consequently, we conduct a case study on a government organization and a service that they provide. Based on a preliminary conversation with the CIO of the City of Winston-Salem, we chose to examine a government service-development approval. This is a typical e-Government process in which different stakeholders (builders/developers, engineers, approval agencies, etc.) are involved. Using a case study approach, we identify the existing problems in the Development Permitting and Approval Process (DPAP)- a popular government service where a transparent collaboration between different stakeholders is necessary.

In DPAP, depending on the project and its scope, a developer has to interact with different government organizations in different phases of the planning process (Ohio State Development and Approval Process Report). These interactions and their implications are almost always not mutually exclusive. Hence, a particular plan has to go back and forth between different levels and departments of the government more than once before it gets approved by all and finally returned to the developer. However, even with all the suggested modifications, the approved plan is often not a feasible one for the developer. In such a scenario, the entire plan approval process needs to be redone. A transparent collaborative process that can facilitate active simultaneous access of all the stakeholders to the current state of the proposed plan can significantly enhance the effectiveness of an e- government's service like DPAP. Web 2.0 based collaboration tools such as the Wiki are used by the IT industry leaders to facilitate transparent collaboration (Nath et al, 2012). In the second phase of our research we conduct a case study on the same government organization where we identify obstacles in the implementation of similar Web 2.0 based collaboration tool(s).



Despite the increasing popularity of the e-Government services, many challenges and bottlenecks still exist which prevent e-Government to be as effective as they can be. In our research, we identify these obstacles and believe that our findings will help government organizations to address these challenges and implement new tool(s) and/or technology(s) successfully.

## 2. Literature Review

Increasingly connected citizens and stakeholders expect governments to deliver services more rapidly and efficiently. Yet the public service bureaucracies that form the governmental backbone often take a conservative approach to adopting the latest internet-based technologies in order to accelerate service delivery (Stephen, 2004). Public sector organizations collect, manage and store large volumes of data on a wide range of subjects such as health records, traffic violations, crime statistics, and literacy rates. The information is stored in numerous systems, from legacy databases to modern content management systems.

When these data are aggregated and cross-tabulated, they can provide a powerful tool for decision makers (Weerakkody et al., 2006). However, internal fragmentation between institutional levels, agencies, departments, often referred to as the silo effect, reduces the efficiency and effectiveness of government actions. In recent years, disasters such as 9-11 and the Katrina Hurricane exposed how lack of collaboration between separate government agencies can hinder the efforts towards prevention or reacting to these disasters. Hence, promoting more collaboration across agencies, or 'joined-up' government, has been one of the key objectives of government modernization (Osamio & Centeno, 2007).

Schräge (1990) defines collaboration as "the process of shared creation: two or more individuals with complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own". Practitioners' literature has been consistently highlighting the importance of improved collaboration in e-Government services (Andrulis & Hiring, 2006; Stephen, 2004), and the same is also true for academic literature (Weerakkody et al., 2006; Chen, 2003). Most of the practitioners' literature promoted a particular set of technology to improve collaboration in the e-Government agencies. For example, Andrulis and Hiring (2006) have suggested adopting Web 2.0 technology to improve collaboration among government and citizens. Academic literature identifies the importance of improved collaboration between e-Government agency and citizens as well as between different e-Government agencies without relying on any particular technology. For example,

Weerakkody et al. (2006) have identified the importance of collaboration at different levels in an e-Government service – Student Loan Application Process. In general, the existing literature suggests that while many of the current e-Government services can be streamlined using proper Information Technology, the effort is largely limited by the available resources (Gant & Gant, 2001), and existing work practice of the involved parties (Madzova et al., 2013; Fan, 2013; Heeks, 2000).

### **3. Research Approach and Data Collection**

Qualitative data was collected for our case study and the principal method of our data collection was semi structured interview. In order to get an overall picture of the DPAP we conducted focus group interviews where representatives from the following departments of Winston-Salem City office were present:

- ✓ Planning
- ✓ Inspection
- ✓ Information Systems
- ✓ Engineering
- ✓ Utility
- ✓ Small Business liaison

We have also used the internal documents related to DPAP of these departments as our secondary data source. A couple of previous research efforts on DPAP also served as our secondary data source. To ensure consistency and reliability, a structured interview guide was used for all the interviews. The interview guide included several open format questions. These questions were distributed among the participants of the focus group interview at least twenty four hours before the interview session. This ensured that the participants had enough time to prepare for the interview. The interviews were combined with observation and a review of council documentation, which allowed the researchers to verify and validate the findings through triangulation (Yin, 1994).

A salient feature of our study is the overlap of data analysis and data collection. We accomplish this desired overlap through field notes. Field notes are an ongoing stream-of-consciousness commentary about what is happening in the research, involving both observation and analysis—preferably separated from one another (Van Maanen, 1988). As interviewers, we transcribed the impressions we gathered during the interview. Since it is difficult to know what will and will not be useful in the future, we took notes on everything that seemed to be important at the time of interview. We then used these notes and ideas for cross-case comparisons, intuition about relationships, anecdotes, and informal observations.

Overlapping data analysis with data collection was important because it gave us the ability to have an early start on analysis (Harris & Sutton, 1986). This overlap also allowed us to take advantage of a flexible data collection method. In general, this flexibility provides researchers with the freedom to make adjustments during the data collection process. For example, we made adjustments in the form of adding cases to

investigate a particular interesting aspect, modification of data collection instruments, such as the addition of questions to an interview protocol, or questions to a questionnaire.

Overall, we followed the guidelines provided by Lee (1989), Yin (1994) and Sarker & Lee (2003) to achieve rigor in our case study. Table 1 below presents the same.

Table 1: Steps followed to achieve rigor of the study as per qualitative case-research criteria

Rigor Criterion	Guidelines to achieve rigor based on Lee (1989), Yin (1994) and Sarker and Lee (2003)
Construct validity	Use of multiple sources of evidence Review of the report by the key informants Chain of evidence
Internal validity	Pattern matching
Reliability	Case-study database (consists of case-study notes, documents and narratives) creation and maintenance Case-study protocol
External validity	Increased degree of freedom Replication logic

### 3.1 Phase 1: Identifying the Existing Challenges of Service Delivery in Government Organizations Case Overview

#### *Overview of the City*

Winston-Salem is a city in the state of North Carolina. Winston-Salem is the county seat and the largest city of Forsyth County and the fourth-largest city in the state. According to the United States Census Bureau, the city has a total area of 132.4 square miles (283.9 km<sup>2</sup>), of which, 129.6 square miles (281.9 km<sup>2</sup>) of it is land and 2.8 square miles (2.0 km<sup>2</sup>) of it (0.81%) is water. Winston-Salem is a prominent municipality in the Piedmont Triad region and is home to some of the tallest office buildings in the region, such as the Wachovia Center. As of the census of 2000, there are 185,776 people, with a total urban population of 299,290, comprising of 76,247 households, and 46,205 families in the city. The population density is 1,706.7 people per square mile (659.0/km<sup>2</sup>). There are 82,593 housing units at an average density of 758.8/sq mi (293.0/km<sup>2</sup>).

#### *Overview of the City Office*

Winston-Salem City office is considered as one of the top ten digital cities in the United States. Broadly they have 45 departments which serve the citizens. Among them the following departments participate in DPAP most frequently:

- Planning - Winston-Salem/Forsyth County Planning Agency plans for the physical development of Winston-Salem and Forsyth County.
- Inspection - The Winston-Salem/Forsyth County Inspection Division is responsible for permitting and inspecting all new building, electrical, plumbing and heating construction within the city of Winston-Salem and Forsyth County excluding the town of Kernersville.
- Engineering - The Engineering Division designs and constructs water and sewer projects, streets and sidewalks, buildings, and other capital improvements. The division also reviews and inspects privately constructed street and utility projects to ensure compliance with city standards and provide information and guidance to private developers.
- Utilities - The Winston-Salem/Forsyth County Utilities Division's primary responsibility is to collect, treat, and distribute water, waste water, and solid waste.

#### *Overview of the Development Permitting and Approval Process (DPAP)*

The majority of property developers, most architects, and a significant number of private home owners apply for municipal approval of development proposals. This can be in the form of a simple building plan, application or via the more delicate procedure of changing land use rights by means of consent or rezoning in order to facilitate the re-development of a parcel of land. In our case study we have found that rezoning is one of the most complicated processes and involves the participation of majority of the departments. Most of the other DPAPs are subtasks of the rezoning process, hence they are less complicated. Therefore, we chose rezoning as the representative of a DPAP.

In cases where the use of a proposed building development differs from that which is permitted on a particular piece of land in terms of the applicable town planning scheme, an application has to be made to the local authority for a change in the uses applicable to the stand. Hence the popular term “rezoning”. The correct term for “rezoning” is an “amendment scheme”, because the applicable town planning scheme is amended so as to permit a different set of uses and conditions on the specific terms in question. This can be a lengthy process involving advertising of the intention to rezone, an opportunity for objections to be submitted to the local authority by interested and affected parties, the circulation of the application by the local authority to a number of other departments and government bodies for comment, the preparation of an environmental impact assessment report in accordance with environmental legislation, and the calculation of development contributions.

A rezoning application is also required in cases where, although the use of the property remains the same, a change in conditions such as the height restriction, the coverage allowed, the density zoning or the permitted floorarea ratio are necessitated by the proposed new building development. Rezoning applications are subject to a formal hearing when there are objections by interested parties, and the final decision can also be subject to an appeal to a higher authority (such as the Townships Board).

A research effort by a team from University of North Carolina at Chappell Hill has drawn an upper level representation of the rezoning part of DPAP. This is represented in Figure 1.

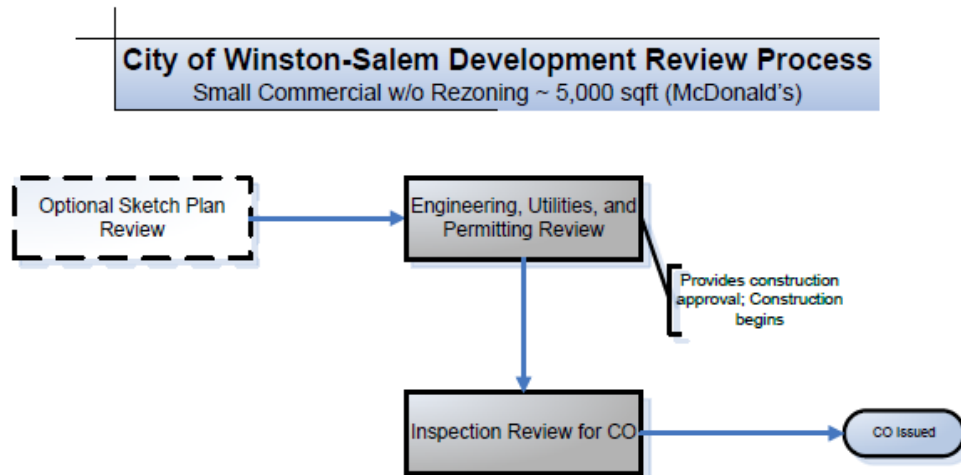
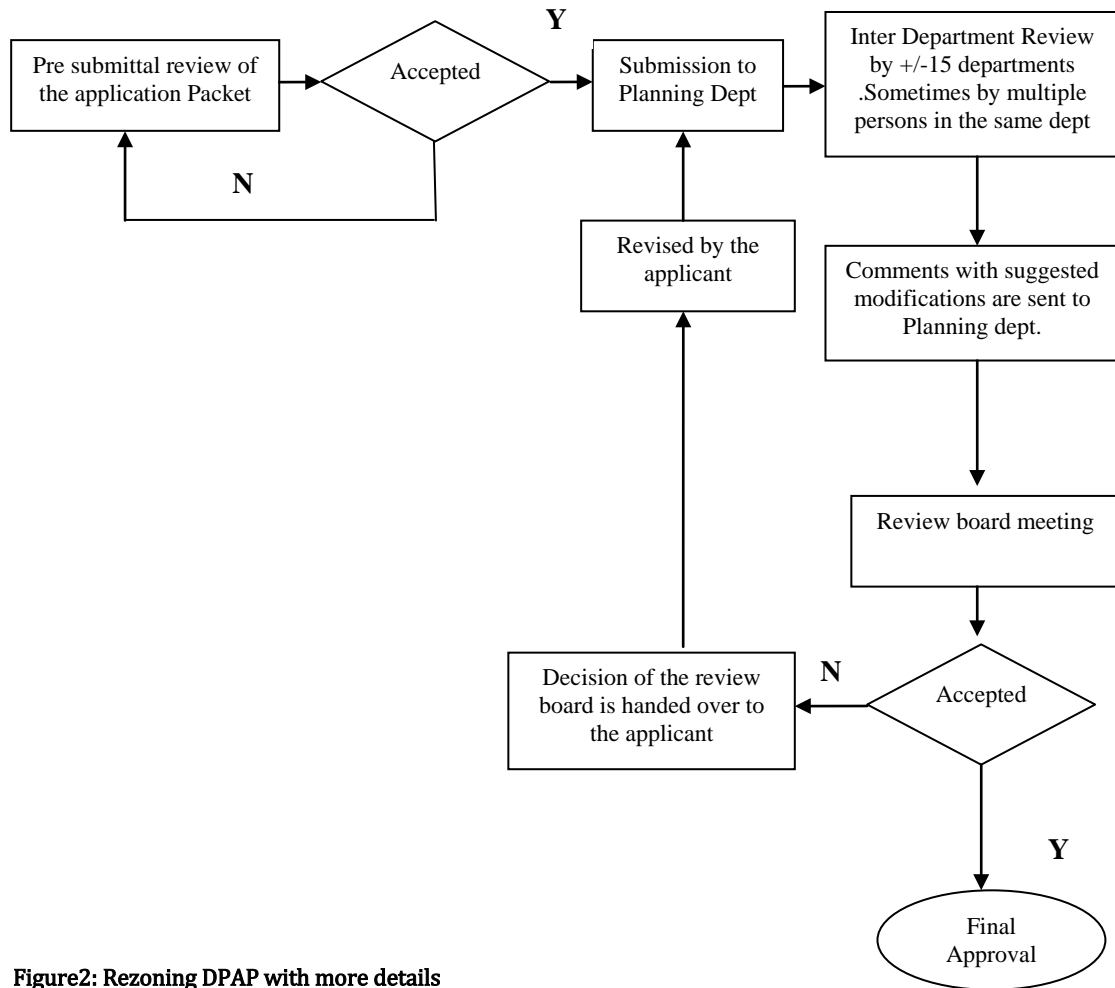


Figure1: Upper level view of Rezoning DPAP(Source: IOG benchmarking report,2008)

However, it has been drawn from such a high level that it fails to capture the complexity of the overall process. Hence, we have developed another diagram based on the collected data that has more details of the rezoning part of DPAP. This is presented in Figure 2.



**Figure2: Rezoning DPAP with more details**

Once we had an understanding of the existing DPAP through our case study, we identified the existing problems in the current process as answers to our first research question. They are:

***It depends – lot of tacit knowledge within each department***

One of the major problems in the DPAP is that there are many conditions based on which a decision is taken as to what process a particular application has to go through. Quite a few parties are involved in a DPAP and their involvement (or not involvement), and the respective role is decided based on different conditions of each application. Therefore, if someone asks a simple question like “What do I need to do to get this approval, most of the time the answer is “It depends”. There is a huge amount of tacit knowledge within each department and the overall organization that gets the approval process. For example, a representative at the city office mentioned about the flow of the application processing as, “It depends where an application will go- say if it is business and you are just rezoning then it would not come to utilities. It also depends on what level it is.” But clearly, there is a lack of understanding of the overall process among all the involved departments and the people working in different aspects of the approval process, let alone the understanding of the citizens who are applying for approval.

***Lack of Transparency between departments***

In the DPAP several departments are involved; including but not limited to Planning, Inspection, Utility, and Engineering. Depending upon the location of the piece of land, the type of construction and other factors, involvement of department(s) is decided. A development plan has to be approved by all the involved parties in order to get the final approval for a development plan. Therefore, whenever an application for approval is submitted, multiple copies of the applications are made or provided by the applicant. These copies are

distributed to the different departments, in some cases multiple copies to the same department as multiple persons within the same department are involved in the approval process. The problem arises from the fact that all these departments and people working on the approval process work in silo. These individuals and departments rarely exchange any information till the designated meeting. As a result, a situation can arise where the modifications suggested by one department, is not in compliance with the requirements of another department(s). Therefore, all the suggested modifications need to be revised again till a consensus is reached. However, such consensus becomes hard to attain due to the lack of collaboration and transparency among different departments. As described by a representative from the Inspection department, *"There is a comment sheet that is sent electronically to the various departments or reviewers. They put their reviews in the sheet and email it back. A person in the planning department then compiles everything into a master sheet followed by a meeting after 2-3 weeks. The representative from each department and the applicant attend the meeting and they sit around the table. Each discusses the problem they have with the plan and how the plan needs to be changed. The petitioner gets the information, changes the plan and resubmits it."*

**Lack of Transparency between City Office and Citizens**

Lack of transparency that exists within the organization gets extended to the citizens as well. Due to aforementioned "It depends" and "transparency" problem, it becomes very difficult for an applicant to know what he actually needs to do and/or submit for his application. There are some basic guidelines and requirements which are available for the applicants in a checklist format. However, there are many exceptional cases and submission requirements which are not covered in that checklist provided by the city office. Surprisingly the city office counts on the fact that the applicant is a professional developer and that he will be knowledgeable about the additional requirements from previous experience. Because of the lack of collaboration and transparency embedded in the whole process, it becomes difficult for both the city officials and the applicants to estimate the length of time for completion of a particular approval process.

**Redundancy in the process and information**

Different departments in a city office are part of the DPAP and sometimes even within the same department more than one party is involved in the process. Therefore, it requires the application (including the plan) submitted by the applicant to be distributed among all the involved entities. All the involved departments work in such silos that the same set of data on an application is entered in several systems. Thus the departments and the reviewers work on the data on their legacy systems instead of using any single standardized system where it is visible to all the involved parties. There are situations when the same data on a single project has been entered in as many as sixteen different systems. As described by a representative from the planning department, the process is as *"non-electric"* as it can be and *"There are multiple points of data entry"*.

Identified problem	Example(s) of Quote that indicates the problem
It depends - Lot of tacit knowledge	Regarding the process flow of DPAP •..... <i>if the property is zoned appropriately but they need water and sewerage connection or extension, they need driveway permit and they need to deal with utilities, inspection and engineering; planning is out of the ball game. Again there could be a situation where that come to our office and they do not need any sewerage extension then they do not need to deal with engineering, it is just the inspection. Again depending on the situations and we have all these different scenarios."</i> (Representative from Inspection) • <i>"It depends where an application will go- say if it is business and you are just rezoning then it would not come to utilities. And it also depends on what level it is."</i> (Representative from Planning)

Table 2 presents the identified challenges.

<p>Lack of transparency between departments</p>	<p>Regarding the communication between departments once an application has been submitted and distributed among different departments-</p> <ul style="list-style-type: none"> <li>•<i>"There is a comment sheet that is sent electronically to the various depts. Or reviewers. They put their reviews in the sheet and email it back. A person on planning then compiles all that into a master sheet and then 2-3 weeks later there is a meeting. The representative from each department and applicant come to the meeting and sit around the table. Each presents what issue they have with the plan and how the plan needs to be changed. The petitioner gets that information, changes the plan and resubmits it."</i></li> </ul> <p>(Representative from Inspection)</p> <ul style="list-style-type: none"> <li>•<i>".....No formalized communication. May be by email. But if I put in my comment here Kevin is not going to see it until the day of the meeting. That's sort of subtle."</i></li> </ul> <p>(Representative from Inspection)</p> <p>Regarding an approval related to Utility</p> <ul style="list-style-type: none"> <li>•<i>"What we have done for our particular process, I have tried to connect them in a way so that people in Engineering and utility can see what is going on other side. But we do not know what planning is doing."</i></li> </ul> <p>(Representative from Utility)</p>
<p>Lack of transparency between city office and citizens</p>	<p>Regarding how an applicant would understand DPAP-</p> <p><i>".....basically we just assume that the project that is under consideration, people who are working on that have some sort of understanding of what they are doing if it is not what I would call a mom and pop property and they are trying to figure out what to do with that."</i></p> <p>(Representative from Inspection)</p>
<p>Redundancy in the process and information</p>	<p><i>Regarding handing an application</i></p> <p><i>"It is so "Non-electronic". That is one of the things which can really produce a lot. There are multiple points of data entry. Once the application has been submitted. We have to do legal ads, the spread sheets and.....</i></p> <p><i>There are 13 points of information entering in Planning"</i></p> <p>(Representative from Planning)</p>

**Table 2: Identified Challenges**

**3.2 Phase 2: Obstacles in Implementing New Technology for Collaboration**

Web 2.0 technologies, in particular Wikis, blogs, RSS feeds, are used by leading IT organizations to address the challenges of collaborative work (Nath, 2012). We believe use of same and/or similar tools can address the existing challenges and bottlenecks of the current e-Governments.

We conducted another phase of case study in the same government organization to identify the obstacles in implementing the collaborative technologies. The identified obstacles are as follows:

***Realization by the Upper Management***

One of the major problems that have been identified as a possible obstacle to adopt the proposed solution is the realization by the upper management who actually makes the final decision to adopt a new technology. As pointed out by a representative from the planning department, *"I think the first is the lack of understanding of the decision makers. In other words, those who decide what we do and how things are automated, do not have an understanding of things that are going on"*. On the other hand, in the organizations where Web 2.0 technology has been adopted successfully, the technology was introduced and promoted by the upper management (Nath, 2012). Therefore, the lack of understanding of ongoing problems in the current DPAP by the top management in combination with their lack of understanding of the potentiality of Web 2.0 technology, are jointly a major obstacle in improving the current DPAP with Web 2.0 technology.



**Adoption of the new work paradigm by the existing people**

Adoption of new technology is always a challenge. From an organizational perspective, the paradigm shift and change of culture that e-Government would introduce to government institutions would certainly face resistance as seen in other forms of organizational change such as business process reengineering (Avgerou, 1993). It is a bigger obstacle in a setup like DPAP where different individuals from different departments are involved and quite naturally not all of them are technologically efficient. Moreover, in the Web 2.0 environment, sharing is the core principle of Web2.0 technology. However, those participating in the current DPAP have been working in silos for many years. Therefore, it would be a long learning curve for them to adopt Web 2.0 technology in the DPAP.

**Time to create an effective repository**

Adoption of Wiki like technology in document sharing for projects will positively affect the DPAP immediately. However, by nature a Wiki like technology takes time to create an effective repository as the network effect has to become prevalent (Anderson, 2007). Hence, it will be a lengthy process to witness a visible improvement in the overall knowledge management of DPAP through Web2.0 technology. Our data from the leading IT organizations in USA, suggest that it might take up to two years to see significant results (Nath, 2012). Therefore, unlike many technologies its impact might not be visible immediately and that might restrain an organization from adopting a Web 2.0 based solution.

**Technology Adoption Cost**

Adoption of Web2.0 based collaboration technology, like any other technology, has an adoption and implementation cost associated with it. While Web 2.0 collaborative technology is cheaper than most of the other collaborative technology, it has its cost and an organization has to bear it. For a government organization adoption of such technology can increase service efficiency. But, as pointed out by representative from Inspection, having the budget to adopt a new technology is a challenge as this is not going to "directly" generate a large amount of revenue. Therefore, getting an allocation in the budget for adopting Web 2.0 technology is a major obstacle.

Table 3 below lists the identified obstacles in adopting technology.

Identified Obstacles	Example(s) of Quote that indicates the obstacle
Realization by the Upper Management	Regarding the obstacle associated with having new system to address the existing problems in DPAP <i>"I think the first is the lack of understanding of the decision makers. In other words, the people who decide what we do and how things get automated don't have an understanding that this is happening".</i> (Representative from Planning)
Adoption of the new work paradigm by the existing people	Regarding learning new technology <i>"But unless otherwise someone has told me I would not have tried it out as all of us are busy, right. You work for 8-10 hours, come home and you do not get time to find those out unless otherwise someone tells you."</i> (Representative from city office)
Time to create an effective Repository	Regarding using Wiki to create an internal repository <i>"For last few years people have contributed and made it a quite useful one."</i> (Representative from city office)
Associated cost	Regarding the obstacle associated with having new system to address the existing problems in DPAP <i>".....we have only so much money and so many resources and this is very far out on the priority list and just stays out there".</i> (Representative from Planning)

Table 3: Identified Obstacles

**4. Conclusion**

In the current state of e-Government, lack of digital collaborative network is one of the major obstacles in the way of providing more efficient services to the citizens and businesses. The suggested collaborative approach in this paper is for a specific local government process. However, we believe that the outcome of the research project is generalized enough to act as guideline for other government processes and agencies- wherever a digital collaborative network needs to be implemented.

This particular project takes into account an ongoing problem of the e-Government agencies. Hence, this project essentially is guided by the practitioners' point of view. However, from academic point of view, we have contributed to the existing academic literature. First, we have identified the problems in the existing collaborative work in e-Government agency(s) and second, we have identified the issues associated with the implementation of digital collaborative network in an existing e-Government agency(s). We believe these findings will help government organizations to address these challenges and implement new tool(s) and/or technology(s) successfully to make e-Government services more efficient. As a caveat for future research, we would like to identify specific collaboration tool(s) used by the IT industry leaders that can help government organization to overcome these challenges.

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