

Mobile Government and Organizational Effectiveness

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Abstract: *Adoption of mobile technologies by governmental units not only benefits the parties who use these services, but also can have a positive impact on the internal workings of public sector organizations. Case studies of five governmental entities that initiated mobile applications reveal evidence of higher productivity and cost and operational savings. This new way of performing tasks also has implications for organizational structure, business processes and civil workers. In the context of Kushchu and Borucki's (2004) Mobility Response Model, this paper underscores some of the issues that might arise in these areas by examining a small sample of ongoing mobile government projects, and concludes with enhancements to the model.*

Keywords: mobile government, mobility response model, organizational change, change management, civil worker, business processes

1. Introduction

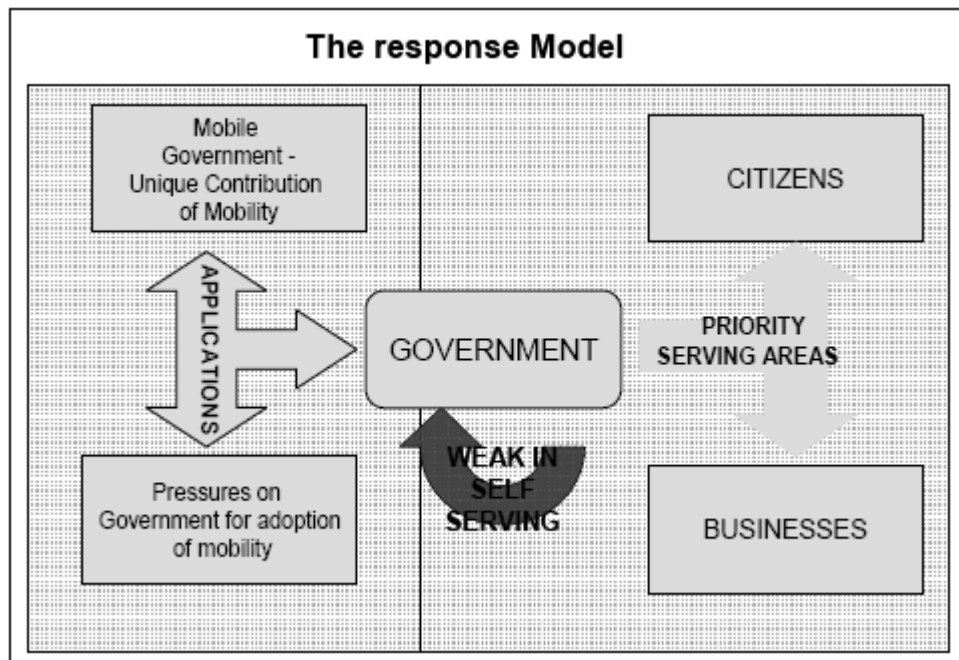
Wireless technologies are leading the trend towards a ubiquitous and pervasive living environment allowing individuals and organizations to engage in a wider range of activities anywhere, anytime. Tablet PCs, mobile phones, PDAs and smartphones are becoming an indispensable part of life, for personal and professional purposes. Mobile applications are allowing people to benefit from not only unrestricted freedom of movement, but also the information and guidance that these devices provide based on the location or context of the user.

In recent years, advancements in Information and Communication Technologies (ICT) and especially the rapid adoption of mobile phones around the world have contributed to the introduction of new mobile technology applications and services. Hence, mobile technologies offer solutions to a wide range of audiences ranging from individuals to businesses and government institutions in a world where speed and efficiency matter the most. Mobile Government, a relatively new term, refers to those government applications and services made available to the citizens via the use of mobile technologies. (Kushchu and Kuscu, 2003)

At first glance, applying wireless technologies within the traditionally bureaucratic, slow-paced and rigid public sector entities may seem a little out of place. But the increasing number of mobile government applications around the world show that there are many opportunities for governments to improve and enhance their services and cut down on operational costs to enhance organizational effectiveness. Traffic updates, navigation assistance, emergency assistance, weather updates, notification for tax and bill payments, field inspections, and a tracking system for stolen vehicles are some of the more common applications used by the public sector. (Yu and Kushchu, 2004) The effectiveness and the acceptance of mobile technologies are still in question as only time will tell how well these applications will answer the needs of the users.

Logic would suggest that government organizations should try to work interactively with the public to better understand their immediate needs and address them in the fastest and most effective way possible. Utilization of mobile government applications will undoubtedly contribute to faster, higher quality and more effective service offerings to the public. However, at the same time, these applications might necessitate changes within the internal workings of these government organizations in terms of organizational structure or business processes, control mechanisms and organizational culture. Kushchu and Borucki (2004) contend that while mobile government applications have significant benefits for citizens using these new services, the government units that employ mobile solutions have yet to achieve notable gains in productivity. Furthermore, they warn that given the bureaucratic nature of public sector organizations, critical changes should not be expected in their organizational structure and decision-making processes in the near future. However, they also predict that as the demands of the public accelerate, governments will eventually be forced to make adjustments concerning these issues.

According to Kushchu and Borucki (2004), governments implement mobile technologies either as a response to complement their existing e-government initiatives or as a response to take advantage of the benefits of mobility. Their Response Model, presented below, illustrates the factors that contribute to the adoption of mobile technologies by government organizations. The model indicates that governments feel pressured to embrace such applications by citizens and businesses and to utilize the “mobility” characteristic of such applications. Yet it is not thorough enough in clarifying the causes of such pressures on the internal workings of the organization.



Source: Kushchu and Borucki (2004), *A Mobility Response Model for Government*

In this paper, we focus and expand on the “unique contribution of mobility” aspect of the Response Model and try to draw general conclusions about the effects of mobile applications on government entities. Five mobile government projects (4 from the United Kingdom and 1 from Hong Kong) will be analyzed to show that internally, efficiency gains are being realized, though changes are primarily in business processes rather than organizational structure. Though such a small sample places restrictions on the generalizability of the findings, the results nonetheless are indicative that some internal processes of government entities are indeed undergoing change as a

result of the adoption of mobile technology. Thus, the paper will highlight some of these potential mobile technology-influenced changes in the form of structure or business processes, as well as in the attitudes and skills of civil workers with respect to organizational effectiveness.

2. Five Case Vignettes

There are numerous ongoing mobile government projects in different parts of the world. In this section of the paper, five case examples will be presented and briefly reviewed.

2.1 North London Strategic Alliance Street Wardens Pilot Project Overview (UK)

North London Strategic Alliance (NLSA) Street Wardens Pilot Project, a collective effort of four London Boroughs (Enfield, Haringey, Barnet and Waltham Forest) is a mobile government application aimed at streamlining the operations of street wardens. The scope of this pilot is currently limited to environmental crime and abandoned vehicles (Online Source 1). Street wardens fill in information regarding the incident at the scene using a mobile device like a XDA2 smartphone or Pocket PC, which have GPRS and Bluetooth connectivity as well as mapping capabilities. These mobile devices allow instant transfer of the information to a password-secured database accessible via the Internet, significantly enhancing responsiveness, as well as the accuracy of the information. Using their mobile devices, the wardens can also now take pictures of environmental crimes to support their formal letter to the citizens involved.

2.2 Barnsley Metropolitan Borough Council, Berneslai Home Impact Team Officers Mobile Data Project Overview (UK)

Berneslai Homes is a new organization within the Barnsley Metropolitan Borough Council specifically created to establish better relations with the tenants living in the council housing. In order to find a solution to anti-social activities, a key tenant concern, Berneslai Homes replaced the existing Council Estate Officers with 42 Impact Team Officers who will use Bluetooth-enabled mobile phones and iPAQ handheld devices to instantly transfer their reports on anti-social behavior taking place in council housing estates (Online Source 2). Previously, the Council Estate Officers had limited interactions with the tenants since they were generally present only when there was a complaint, after which they completed their reports upon returning to the office, which were then uploaded to the council's IT system. Now the Impact Team Officers will spend their entire time on the premises completing and transferring their reports wirelessly, and the information systems of both Berneslai Homes and the Barnsley Metropolitan Borough Council have been integrated, resulting in smoother operations and knowledge sharing.

2.3 Mobile Working at London Borough of Barking and Dagenham Project Overview (UK)

Mobile Working at London Borough of Barking and Dagenham Project enables 6 void inspection surveyors, who handle 2000 void inspections every year, to use Pocket PCs to transfer their findings electronically back to the office. Previously, the surveyors were relying on Dictaphones to keep a record of the inspection results and then taking the tapes to the office for two typists to transcribe. A paper-based questionnaire was also filled out by the surveyor during each site visit (Online Source 3). The old process was labor-intensive and time consuming. Now these

surveyors can not only transfer data, such as inspection results and questionnaires seamlessly, but also access additional information such as timescales and tenancy agreements in the field. The organization is planning to extend this project to include the remaining 12 surveyors who are annually in charge of 80,000 responsive repairs.

2.4 Norwich City Council Street Scene Project- Parking Services Overview (UK)

Norwich City Council Street Scene Project enables 34 parking attendants to report illegal parking and environment-related concerns using handheld devices to the central parking system called Langdale (Online Source 4). Since monitoring environmental concerns such as litter, graffiti, and abandoned vehicles are also among their secondary duties, the parking attendants submitted reports to the relevant authorities for further action via e-mail. With this project, the attendants will be able to upload their reports on illegal parking to the Langdale system wirelessly. They will also be able to submit their environment-related reports to the parties concerned like City Care or Environmental Health (Comino system) electronically, which means this project will allow the parking system and environmental health system to be loosely integrated to work more effectively together. The project will also eliminate the need for attendants to be present in the office for the daily briefing with the Parking Team Leader since a messaging system will be developed to inform them of new developments each time they connect to the system.

2.5 Environment Protection Department of Hong Kong Mobile Field Inspection System Overview (Hong Kong)

Environment Protection Department (EPD) of Hong Kong is the authority in charge of environmental issues and conducts regular inspections on chemical waste collectors and compiles the compliance results. Prior to the implementation of the Mobile Field Inspection System, the inspectors were writing their reports on paper and then reentering the same data into the database at the office. This business process was not very efficient. Therefore, EDP introduced a mobile field inspection system which uses touch-screen PDAs to enter the inspection information at the scene. The inspectors are also able to review the results of past inspections through their PDAs to have better knowledge about the inspected waste collector. Once the data is stored in the PDA, it is transferred directly to EDP's back-end system (Online Source 5).

3. The Impact of Mobile Technologies on Government Organizations

The five projects reviewed above are admittedly small-scale, are local rather than regional or global projects, and involve a small number of civil servants in a few departments. However, these examples are indicative of the potential effects of mobile technologies on the inner workings of government entities with respect to productivity, structure, business processes, and civil workers – and consequently, the effectiveness of government organizations.

3.1 Productivity and Operational Efficiency Gains

One expected outcome of utilizing mobile government applications is increase in productivity in line with the increasing demands of the citizens for faster and better service. In the case of North London Strategic Alliance (NLSA) Street Wardens Pilot Project, the efficiencies realized included a 20% time savings in report writing for wardens, and an increase in the response rate of wardens to incidents (they can be on the road longer since they don't have to return to the office).

In addition, unnecessary work that was being duplicated was eliminated as previously, wardens who handwrote a report had to go back to the office to re-enter the information into the database. Also, an increase in the accuracy of reporting and reduction in citizen claims and legal costs due to visual evidence was realized, along with cost savings for each council for abandoned vehicles (Online Source 1).

As for Berneslai Home Impact Team Officers Mobile Data Project, some observed benefits include operational efficiency in the form of elimination of duplicate work, minimization of traveling time, and attending to more tenant complaints. Cost savings were also achieved since less office space and workstations are needed, and there are now better service offerings to tenants (Online Source 2).

Mobile Working at Barking and Dagenham Project increased productivity in that surveying time has been improved and increased by 2 hours per day, and the void turnaround has been reduced by at least 2 days. The services of two typists were no longer needed for transcription work, and because the surveyors no longer have to return to the office, less office space is required. The surveyors are able to access more information outside of the office which contributes to the quality and accuracy of their reports as the data gathered has improved (Online Source 3).

Thanks to the mobile technology deployment, Norwich City Council Street Scene Parking Services expects to increase productivity by around 15% (from 60 to 75%) through a one man hour saving per parking attendant every day. This may not seem significant, but if the attendants were to be out in the streets rather than staying in the office in this “non-patrolled” time period, it is estimated that 6,000 additional tickets would be issued annually and the organization would earn an additional £112,000 revenue. There will be less paper work since the environmental reports will be sent to parties concerned electronically, and a need for less office space since the parking attendants do not need an office to perform their tasks anymore. Instead they will be using a new depot at the city center (Online Source 4).

As for EDP Mobile Inspection System, some of the savings include an increase in productivity by around 10%, a 1.5 man hour saving per inspection team on a daily basis, and elimination of duplicate work (Online Source 5).

3.2 *The Impact on Structure and Business Processes*

Increase in efficiency and productivity due to mobile government applications is inevitable and may possibly reflect itself in the structure of the organization in the following ways:

Reduction in the number of people performing the job. Introduction of mobile technologies can result in taking unnecessary work out of a governmental organization, as exemplified above by the elimination of the need for two typists engaged in transcription work.

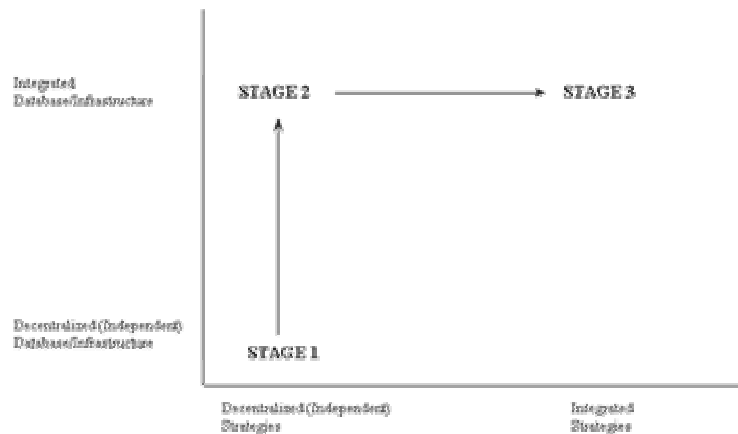
Establishment of new virtual departments. Mobile technologies enable government employees to spend their time in the field. The 6 void inspection surveyors on the London Borough of Barking and Dagenham project no longer require office space, and under consideration is whether they should be based at home. Another example of a “virtual department” is the National Department of Seniors in Canada which offers local, regional and national services to Canadians in English and French. Although this department is not part of the

existing organizational structure, its online services are manned by a group of civil workers working in local, regional and national government entities. (Robillard, 2003; Online Source 6).

Flatter organization, enhanced knowledge sharing. Introduction of mobile technologies thus suggests that the organizational structure will become flatter with fewer hierarchical levels and looser connections between employees. Being able to access recent information “anytime and anywhere” may require a more integrated approach to mobile government solutions. For instance, an inspection report prepared by one warden in one Borough using mobile technologies may need to be shared by other Boroughs in London or even across the UK and accordingly, business processes may need to undergo change. Since currently the information within different government entities and different departments within the same government organization is scattered, mobile government can help to combine all organizational knowledge on a real time basis so that process time and costs are reduced. For instance, Norwich City Council Street Scene, Parking Services Project allows efficient information flow and sharing between parking services and environmental health. Similarly, Berneslai Homes and Barnsley Borough Council have integrated information systems that allow the civil workers, who have different roles/tasks in the same process, to perform faster and more effectively.

However, in all these projects, since it’s only the wardens, inspectors, surveyors, attendants and officers who are affected by new mobile applications and it is simply using a new tool to do the same task, it is unlikely that we will witness immediate structural changes, at least for the time being. But as more interrelated departments start using mobile applications, department consolidations are to be expected. In the transition phase, most probably these interrelated departments will first integrate their databases or information sharing processes and then gradually move into a full-scale consolidation.

More efficient processes. Mobile government’s biggest impact is likely to be on streamlining business processes on a single, shared platform by gathering, updating and processing data from all departments anytime and anywhere. The diagram below shows the evolution of mobile government. Although it’s too early to predict the progress of mobile government strategies, it is possible to expect that initially, such strategies will be decentralized as they are likely to be first tried out locally rather than on a city or country basis. Accordingly, the database and infrastructure supporting these strategies will be independent of a unified database or infrastructure. In the second stage, as mobile government applications become more common and successful, more local authorities will adopt them, paving the way for a common, unified database and infrastructure within and among various government units. In the later stage, a more integrated mobile government strategy will be favored within the government as a whole and an integrated database and infrastructure will allow the information to be shared across all government entities.



3.3 *The Impact on Civil Workers*

Training for new skills, new job descriptions. With respect to specific mobile government applications, civil workers may need to acquire new skills such as learning how to use a new wireless device or how to enter information via wireless networks. Although these devices and applications may be user friendly, depending on the age and background of the users, adaptation may take longer than anticipated, hindering the success of the project or causing delays in outcomes. Furthermore, some adjustments in the civil workers' job descriptions may be required or the new application may call for hiring new people with different skills into the organization.

As an example, before the introduction of the NLSA Street Wardens Project, twelve wardens who are part of the pilot, were handwriting the information at the scene and then returning to the office to reenter that information into a database to be accessed and shared by other departments. This meant waste of time because of duplication of work. Furthermore, the wardens weren't quick enough in attending to new incidents since considerable time was required for report writing. Once this project was introduced, the street wardens were able to use mobile devices to enter information about the incident on the spot, eliminating duplication of efforts and freeing them from spending unnecessary time at the office. However, since this was a new tool with many features, all wardens had to undergo training for half an hour to an hour. The training sessions, which also involved senior management, were relatively short because the software was developed with simplicity and user friendliness in mind. However, extra training was required for those who weren't used to information technologies.

Similarly, the inspectors at EDP were entering information by hand and then transferring it to the database manually. With the new system, the work process is streamlined and the inspectors have more time at inspection sites. Although they still need to return to the office to synchronize the data with their back-end system, with the introduction of new devices like Blackberry, in the near future, the inspectors will be able to send their reports through their device without going to the office. The PDAs were designed for easy use, so the training time was short.

As part of the Barnsley Metropolitan Borough Council, Berneslai Home Impact Team Officers Mobile Data Project, all Impact Team Officers underwent two days of training in which they learned how to use the device and connect to the database and how to use the forms available to them. Additionally, to assist officers further, 8 people were trained to act as "super users" to be the main contact point when officers faced problems. In the initial stages, management also monitored the officers to see how often they use the mobile solution and tried to understand the reasons behind infrequent usages by some officers. Although these training sessions were successful, during the implementation phase, some technical problems were encountered and these problems affected the motivation of the officers making them wary of the benefits of deploying mobile technologies. Therefore, to overcome resistance to change, it is of utmost importance that the civil workers who will be part of the mobile solution are encouraged to take part during the planning and implementation phase and persuaded that they can perform better and save time by using these applications.

Virtual worker. There is no doubt that with the introduction of wireless technologies into the workplace, the civil workers involved are more mobile than before. As a result, these civil workers could be viewed as virtual workers. They can be informed about the incident and prepare and send their reports via their mobile devices, hence, reducing if not totally eliminating the need to go to the office to fulfill their duties. This encourages a more flexible environment and promotes looser connections when it comes to peer-subordinate relationships. However, having

virtual workers brings with it some important issues that warrant attention such as performance evaluations and working efficiently and effectively, both individually and collectively, as part of a team without direct supervision.

Limited interaction. One potentially adverse effect is that using wireless technologies to perform certain tasks may reduce the amount of personal communication between people. For instance, rather than going to the office and asking for additional information from a colleague, the civil worker may simply use his/her device to obtain that information, never communicating with anyone from his/her office. In other words, face-to-face communication may be replaced with human-to-machine communication and any interdependencies between individuals or departments can be dealt with through the wireless system.

Efficiency at the expense of privacy. Although the mobile government application is aiming to make the working process of civil workers more efficient, due to the location-based nature of the application, it is possible to track them. On one hand, this helps to identify where each civil worker is located and may improve efficiency when it comes to calling on duty the person located closest to the incident. On the other hand, the civil workers may feel that they are being monitored and tracked. This may also have some legal repercussions as these projects become full scale.

4. Conclusions

Governments around the world are now setting very aggressive targets to move towards e-government and mobile government. This bureaucratic or top- down approach, which is to a great extent a result of external pressures from citizens and businesses, at times may fall short of visibly identifying strategies as to the content (what) and process (how) of this shift to e and m-government. In other words, governments should have a roadmap which clearly identifies when it is necessary to make the change, what needs to be changed and how to make it happen.

No significant structural change, but re-engineering of working processes. We have tried to identify the impact of utilizing mobile government applications on organizational structure based on the case examples reviewed above. Although this sample of 5 case studies is insufficient for reaching more than tentative or general conclusions, at least for the near future, it is not likely that we will see major structural changes in public institutions due to mobile government. This, in large part, is because most of the mobile government initiatives are occurring at the local level with the involvement of very few departments and civil workers. Furthermore, these applications do not seem to have a large enough impact on the workings of the organization to necessitate a major structural change. The case studies also indicate that change occurred not in the formal structure of the organization, but rather in the way the tasks were accomplished. In other words, there were some changes in the business processes and workflows of the departments involved. We should also note that structural changes require more time and energy and generally affect more people. However, as more and more departments embrace mobile government applications, a more unified mobile government strategy as well as more integrated infrastructure and databases within the government are likely to be observed. Once this level of adoption is achieved, we expect to witness some changes in the structure of governmental organizations due to bottom-up pressures coming from those local or regional departments that have benefited from mobile government. Such changes are likely to be in the form of virtual departments, consolidation of some departments, and/or reductions in headcounts.

Change in the workings of the Civil Worker- Less Office Space, Looser Ties, Virtual Worker. Additionally, we can argue that the role of the civil worker, who is part of the mobile government service, is likely to be redefined making him/her a more independent, mobile agent accountable to not only one, but many different departments by fulfilling his/her tasks under the mobile government project. The shift to e and mobile government applications will make governments more functional organizations in the sense that tasks would be completed by different people with different skills and job descriptions working in different departments in different parts of the country. This would also facilitate a working environment where the relationships are loosely defined giving more flexibility to the civil worker while performing his/her tasks. As we have mentioned before, the “base of operations” of the civil worker might also shift from office to home, or even car. However, this trend provides challenges for key human resources management practices such as performance evaluation, compensation and monitoring or control over the civil workers.

Coping with Change. Although the examples used in this paper are small-scale and there are few indications of overt rejection of mobile technologies by the civil workers, we should comment on sources of and ways to deal with resistance to change. Habits, fear of the unknown, security and economic factors are some reasons why people can resist accepting new approaches. As a consequence of the implementation of mobile technologies in the workplace, civil workers might view these applications as a threat that will cause them to be replaced or they may have a feeling that they are losing control to machines. The fear of not being able to acquire necessary skills or concerns over future competencies may cause employees to become suspicious of these applications. Education, employee participation, and interpersonal communication should be at the center of this process in order to persuade the parties involved to be part of the change willingly rather than forcing them to agree to the established goals. Forcing the employees to accept something that they don't believe in or something they see as a threat will bring resistance and hindrance during the transition phase and may lead to total rejection later on. In other words, the employees should be motivated and supported all throughout this process.

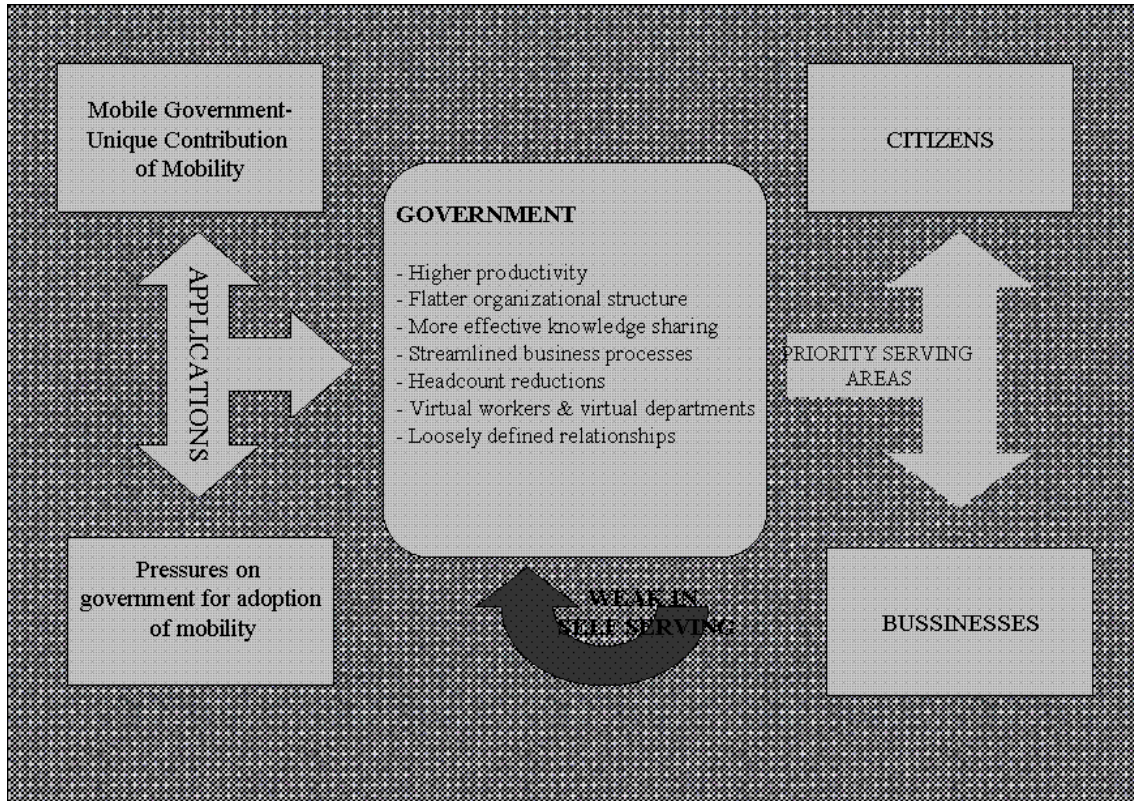
The organizational culture of an organization is of utmost importance when it comes to implementing and embracing change, as culture should “fit” with other important organizational components such as mission and strategy as well as structure. Lucienne Robillard, President of the Canadian Treasury Board, and member of Parliament for Westmount-Ville-Marie, gives an example regarding the Seniors Department in Canada in an address she made to her colleagues:

“...What is also changing, quite significantly, is the role of the individual public sector employee and his or her relationship to information, clients, organization and colleagues. Drawing from our "Government on Line" experience, we are beginning to understand that cultural rather than structural change may be more important at this time. And that our approach to information, information systems and understanding the concept of "communities of practice" may be more radical and necessary than 'machinery' change...” (Robillard, 2003; Online Source 6)

After analyzing some real life mobile government projects, it is possible to enhance Kushchu and Borucki's (2004) Response Model by incorporating the internal effects of mobile applications on government entities (illustrated below). These effects would bring with them better self-serving within the organization and better service to citizens and businesses. There is no doubt that mobile government applications not only make the lives of the citizens easier, but can also increase the productivity and effectiveness of government organizations. However, while adopting such technologies, careful consideration should be made as to their effects on work processes, the civil workers and helping them to cope with change, and the formal structure and culture, or shared values, of the government entity. Such efforts may result in greater chances for

success and may minimize the chances of failure when adopting new technologies and placing them in the hands of civil workers, ultimately leading to the increased effectiveness of government organizations in attending to the needs of the public at large.

THE ENHANCED RESPONSE MODEL



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