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# Analysis of Factors that Affect Government Digitization: A Pilot Case Study of Pakistan

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**Abstract:** One of the greatest factors that affects the economic condition of a country is its institutions. In the model of good governance, the primary elements for stronger institution include efficiency, transparency, and accountability; and technology plays a major role in improving these elements. However, there are myriad of challenges when it comes to practical integration of technology in these institutions for efficiency. It is more challenging when a country is developing and one that is already weak economically. It is also important to mention that the challenges of digitization in public sector is not limited to developing countries only. It is equally challenging, even today, in already developed countries to digitally transform their public institutions for improved policymaking and for responsive service delivery. Many factors contribute to the failure of such digitization initiatives, more so within developing countries. And the purpose of this paper is to identify those factors, to measure the significance of each of those factors, and to realize and overcome them. This research considered the case study of Pakistan; however, the results are very likely to match the conditions of other developing regions around the world. Through questionnaires and interviews, valuable feedback was gathered from up to 25 senior government officers that are closely associated with digitization initiatives in public sector. The feedback to the questions were overall unanimous. The results indicate the most significant of factors that affect government digitization in this developing region, including some factors that were not expected.

**Keywords:** E-governance; government digitization; information management; sustainability

## 1 Introduction

A country and its governments essentially exist to serve their citizens and to provide public services that facilitate the lives of citizens. Ever since the emergence of information technologies, it has been used to improve the efficiency and effectiveness of systems and governance. Nowadays, we are using technology to bridge the gap between governments and their citizens. Many developing countries today have their government operations digitized so that they may offer public services to their citizens more swiftly. This, in return, helps improve the trust of the public in their government, and at the same time makes

government more transparent and thus more accountable [1]. With the integration of technology in public institutions, a country is able to offer responsive service delivery, and it is able to operate in transparency. All of these factors contribute toward fair use of national resources and most importantly—Trust of the public in their government.

Yet as much as there is a need for digitization, there are many variables that affect the implementation of these initiatives. There are many reasons for this, factors such as the organizational structure of bureaucracy, with having multiple government departments bearing overlapped authority over singular tasks [2]. However, organizational complexity is only one factor of the reasons why government digitization initiatives fail. There are many more factors especially when the government is that of a developing country [3]. This research has looked into all these factors, especially in the context of a government of a developing country that has relatively poor economic conditions [4]. Having identified these particular and significant factors that affect government digitization projects, we can then mitigate those risks to curb some of these challenges for effective integration and sustainability of digitized public service delivery, and ICT solutions in general.

Integration of ICT solutions in a governmental organization has been a problem in most parts over the world, however, the problems are higher when it comes to government departments in a developing country. As reported, as much as 70% of the World Bank sponsored digitization initiatives to improve governance in developing countries have failed. By failure it means either they could not be completed in time or were never sustained if completed [5]. So, while integration of ICT solutions is imperative to strengthening institutions in this age, government bureaucracy is still in its oldest design with never-ending red-tapes. And it is through ICT integration in government operations and services that we can improve its transparency and accountability, and enable government to offer responsive services to its citizens. Without it, the economic outlook of a country may not change [6,7].

This article is divided in seven sections as follows. After the introduction, in Section 2, we have the major reasons for the digitization. Further we have the main factors that affect government digitization in Section 3. Then Section 4 presents the methodology and the next section—The findings of the study. The article ends with the conclusions and some recommendations.

## 2 The Need for Digitization

There are many benefits to digitization of government, its internal operations and also its service provisioning over digital platforms [8]. There are challenges of sustainability, however, if there is will, digitization can do much to help improve governance in any organization [9]. It can reduce cost by saving both human resource other material resources for the transportation of files/information that can be very efficiently delivered over a digital medium, without any risk of damage, loss or fabrication [10]. Some of the other improvements that digitization brings include the following

### *2.1 Improved Capacity & Service Delivery of Government*

Backlogs build-up when a public service is burdened by the number of requests, and the government does not have the capacity to deal with an influx of requests for services. Technology and digitization play a huge role in enabling these departments to deal with high amounts of requests, and for them to swiftly offer services efficiently on time, to curb any grievances among citizens and to avoid any distrust in their government. Digitization enables governments to offer improved, efficient, effective, responsive and swift service delivery to citizens via digital public services portals. With improved services, citizens are happy with their government and more taxes are paid in return, improving overall economy of a country [11].

### *2.2 Improved Decision Making*

For improved planning, one requires information of value, otherwise known as intelligence. Good decisions, good plan or policy can never be made without proper information. Today, all developed countries make Data-Driven-Decisions or DDD. That is, their decisions are based upon factual data that is relatively much more accurate in comparison to taking decisions based on an instinct or on physical surveys that may be prone to selective information and not total information. Digitized government offers improved decision making and improved policy making, that ultimate help shape the economics of the country [12].

### *2.3 Improved Transparency, Efficiency & Access to Information*

With open.gov initiatives, public can see where their taxes are spent. This creates a sense of accountability among government country institutions, where expenditures can be analyzed by any citizen of the country, thus government tries to become better to acquire approval of the public [13].

In many ways, digitization improves the internal processes and internal operations of public institutions, with such efficiency it can offer better public services and also become more transparent and accountable. Similar to Open-Data initiatives, improved access to information not only improves interdepartmental correspondence but also improves how citizens to view the performance of their government.

All of these improvements come together to ultimately result in improved economics of a country where performance of institutions are the biggest factors that contribute to the fate of any Country, and Technology and Digitization can go a long way in doing just that [14,15].

## 3 Related Work & the Common Factors that Affect Government

There are myriad factors that affect government digitization at multiple levels and there has been work related to listing all of these factors, however, they are all generalized factors taken from generic environments with general management in play [16]. From the works of Heeks [17] and others [18], it can be summarized that there are two major levels of factors that come into play in affecting digitization of government institutions.

### *3.1 High-level Holistic Factors*

At the highest level, all these factors and the causes for them come under three major folds of complexity [19]. These complexities of factors are listed below.

- Political complexity
- Organizational complexity
- Technical complexity

### *3.2 Mid-level Generic Factors*

At the middle level, we have categorization of all relevant factors under four quadrants [20]. These quadrants are listed below.

- Customer: End users, benefactors
- Environment: Organization cultural factors
- Scope: Feasibility, in terms of budget, time and skill
- Execution: QA, change management, staff training

### *3.3 Low-level Particular Factors*

At the lowest level we have the particular factors that affect Government digitization. Some of these factors are listed below.

- Information—Pragmatism in system design
- Technology—Technological compatibility
- Processes—Integration of the new system
- Objectives—Values and culture of the organization
- The skill level of staff—Training for the new system
- Willingness of the staff—Working staff on the new system
- Management structure—Bureaucracy, red tape
- Time, budget and other resources.

Besides some of these particular and generic factors, there are ways to put them as such that some of these factors act in 'favor' of successful digitization while others act as factors or agents 'against' success in digitization. Such factors are also referred to as Enablers and Barriers. Some of them are listed as follows.

### *3.4 Enablers*

Enablers are the factors that promote the successful execution, completion and sustainability of projects. Listed below are some of the important enablers of government digitization [20].

- Will of the government and their support
- Pragmatic vision and strong strategy
- Donor financial support and external influence
- Rising citizens/customer's hopes and expectations
- Globalization and modernization
- Proactive change management
- Effective planning, management and coordination

### *3.5 Barriers*

Barriers are the factors that prevent the successful execution, completion and sustainability of projects. Listed below are some of the significant barriers to government digitization [20].

- Incompatible infrastructure
- Old and obsolete information systems
- Red-tape, cultural values, organizational rationality
- Lack of skilled staff to operate the system
- Unwillingness to change
- Change in user-needs.
- Incompatible and inappropriate Technology
- Poor coordination among the stakeholders
- Weak IT policy that may be a poor enabler
- Transfer of officers in support of those projects
- Lack of interest from the donors

## 4 Methodology

### *4.1 Research Setting*

This research was conducted in the state of Khyber Pakhtunkhwa within Pakistan. Pakistan is a developing country situated in South Asia. The country's digital journey has gained much attention in the last few years. While the Government is taking the right steps towards going digital, the pace is still slow when compared to other countries in the globe.

There are still challenging areas Pakistan needs to address both in policy making and implementation at the national level. Ownership of policy is also less clear at this stage and needs some focus from the authorities. The devolution of powers to provinces along with the lack of policy alignment has contributed to disparities in national and provincial agendas.

Although public-private partnerships exist, the holistic impacts of PPPs are missing due to absence of consistent, dedicated efforts. Other challenges include fragmented growth in sectors and a weaker regulatory and legal regime in face of changing digitalization demands. Poor facilities, lack of access, and limited awareness and literacy also contribute to the ineffective delivery of services across sectors.

### *4.2 Questionnaire Design, Sample & Feedback Analysis*

The former relevant studies, in Section 3, indicate the range of factors that affect both the success and failure of digitization projects in government. To identify the factors that apply, and to measure its significance, questionnaires were initially prepared out of those factors.

These questionnaires included relevant questions such as—which among the following factors contribute the most toward Success of government digitization projects; and the answers listed all the relevant factors for the government-officer to choose from. Moreover, the officers in their answer also signified each factor on a scale ranging from 0 to 9; where 0 carried the lowest significance and 9 carried the highest. A particular example of the questions included in the questionnaire is listed in Appendix A (Section 1). The questionnaire was created on Google's Online Forms, that is relatively an effective method of gathering data online.

The questionnaire form, after creation, was distributed to a list of up to 25 senior government officials (sample size) that are associated with government digitization initiatives. After the feedback from these government officers was received, office visits were conducted to validate the results through personal interviews with these officials.

Out of the 25 officials, 18 responded fully. All of the feedback and the intensity of each factor was gathered and it was then plotted to visualize the significance of each of the relevant factors that affect the 'success' and 'failure' of digitization projects in a government setting in Pakistan.

## 5 Findings

The answers from all the 18 officers are all very indicative of unanimous factors and their unanimous significance compared to the other listed factors. The resulting answers are near as expected, however, there are some findings about new factors that may have been overlooked previously as shown in Fig. 1.

### *5.1 Answers to Generic Questions*

The majority of respondents from the survey suggested that the completion rate of government ICT projects is around (70%). Moreover, to the question of how many of the projects are delivered on time, the answer was nearly (70%), with (30%) bearing to unforeseen or unplanned-for obstacles and challenges.

Some other questions related to sustainability of these projects over the passage of time. To which the average response was that around (60%) of these projects sustained after a year, which further went down to (45%) in 2 years after its completion.

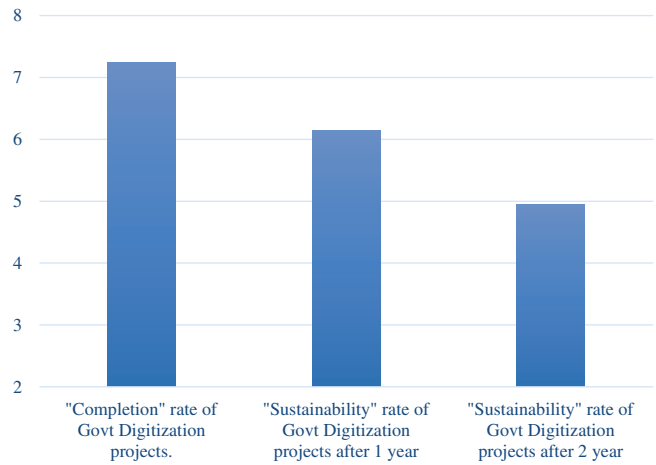



**Figure 1:** Completion, sustainability rates of Govt ICT projects over time

It is then interesting to note that even though, there is a good chance for an ICT program to reach completion, however, over the passage of time they are hard to sustain. Just within 2 years 1 out of 2 completed projects fail to sustain as shown in Fig. 1.

### *5.2 Where Most of the Ideas for Digitization of Government Come from*

It was realized from the answers that it is mostly International Donor Agencies that suggest ideas for government digitization as illustrated in Fig. 2.

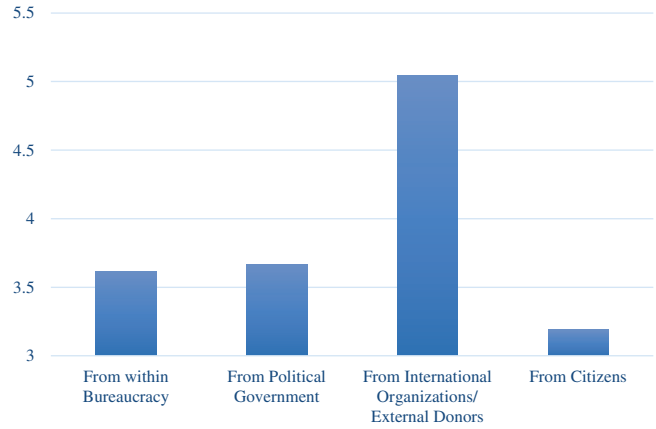



**Figure 2:** Where do ideas for Govt digitization come from?

Economists believe the strength of institutions are what defines the economic status of a country. With stronger institutions, nations can prosper and be more sustainable. That is why suggestions for government digitization often come from developed nations.

### *5.3 Factors that Significantly Affect the "Completion (only)" of Government Digitization Projects are the Following*

In the answers to this question, the main factors that affected completion of government digitization initiatives were the bureaucracy and the political government, as can be seen in Fig. 3.

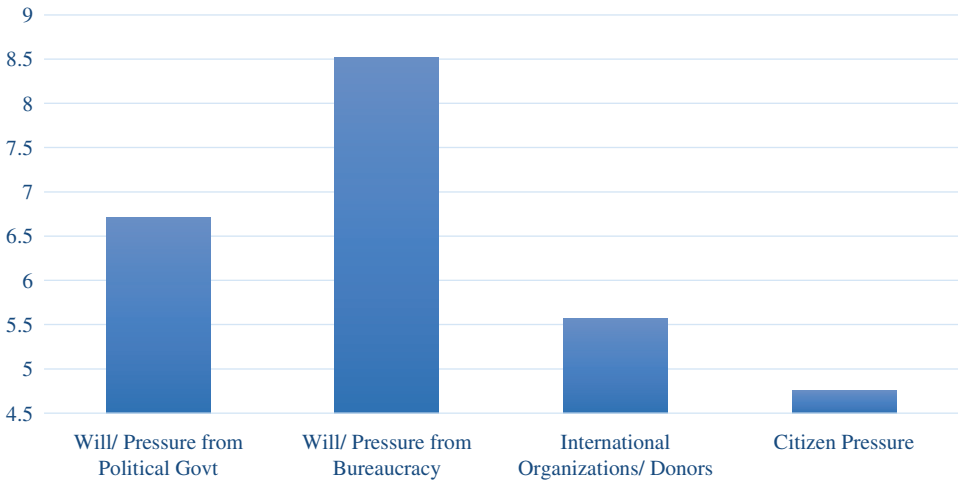



**Figure 3:** Factors that affect 'completion only' of Govt digitization projects

From the results in Fig. 3, it also appears that bureaucracy has the most influence over the success or failure of digitization programs in government. Political government comes second where it has its role in pressuring bureaucracy but ultimately all executive and operations and maintenance lies with bureaucracy, whom, if they wish, can sustain a program and at the same time weaken it through negligence. This also relates to the fact that either when Political government changes or bureaucracy shuffles, government programs get affected because the new political government might have new or different ideas to work on, and bureaucracy is yet to catch up with an existing program that may be left neglected, resulting in failure of such programs in the longer run. Which brings us to the next question.

### *5.4 Most Significant of the Common Factor for "Sustainability" of Government Digitization Projects*

Apart from 'completion-only' of these digitization programs, this question was asked to realize what it is that contributes most toward sustainability, something that gets lower over the time as shown in Fig. 4. The major factors for sustainability of projects are as follows:

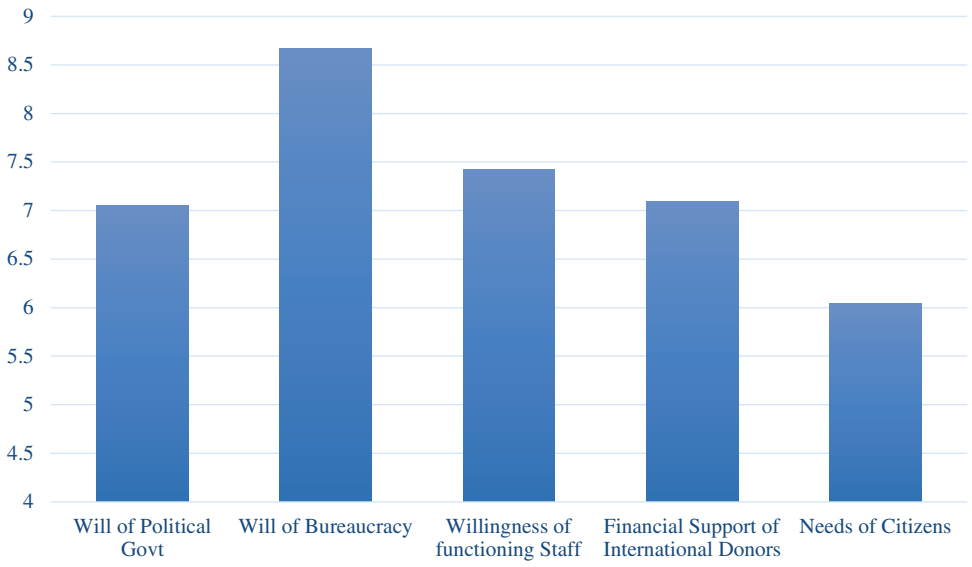



**Figure 4:** Factors that determine sustainability of digitization projects in Govt

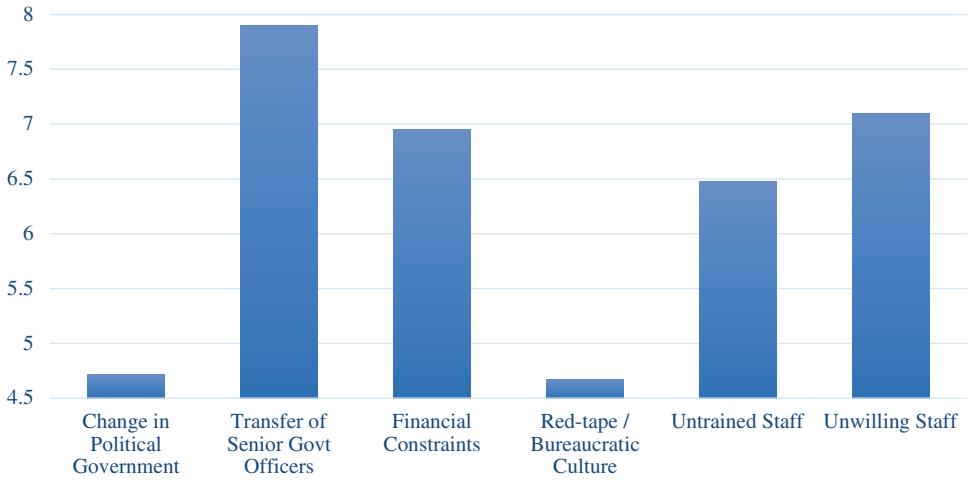
- Will of Bureaucracy
- Willingness of Officers & Staff

Most significant of the factors, more than 'Political will' is the will and the pressure from bureaucracy, followed by 'Willingness of the Officers and Staff' operating that program, followed by continued financial support by IGOs—International Government Organizations. Needs of citizens matters least in this respect.

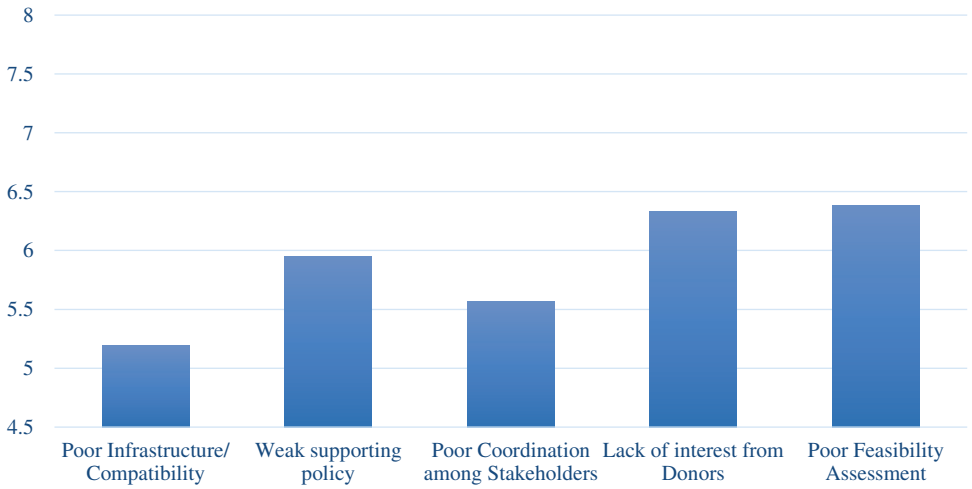
### *5.5 Most Significant of the Factors for Causing Failure of Government Digitization Projects*

Contrary to the popular belief, more than change in political government, the shuffle in bureaucracy is what affects government digitization programs the most as shown in Fig. 5.

The second most significant factor that causes failure is the unwillingness of staff, something that is associated with bureaucracy and how well they are trained to comply with the demands of senior officers, and how with change of officers may come change in compliance of staff, that ultimately result in failure of projects.




(a)




(b)

**Figure 5:** (a) Factors causing failure of govt digitization projects (b) Factors causing failure of Govt digitization projects

### *5.6 Most Significant Factors that Promote Success of Government Digitization Projects*

It is obvious from the answers that it is the executive body of the country that most significantly affects the overall success of government digitization projects as shown in Fig. 6.

If there is will from the bureaucracy, and the ability to strategize and effectively plan and manage the program, it will ultimately lead to the success of these projects. At the same time the same factors may also contribute negatively, if there is little will, and poor management and poor strategy, significantly toward failure of such programs. Furthermore, something to note is that Citizen pressure least affects the success of these programs.

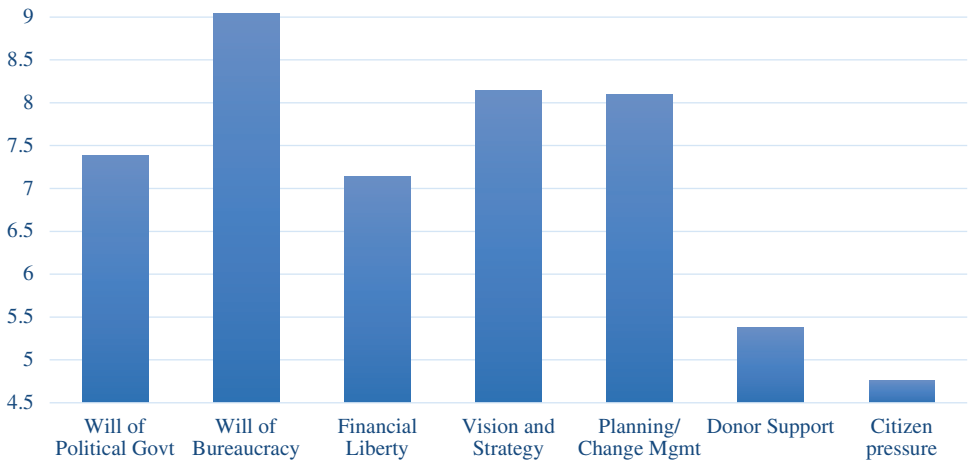



**Figure 6:** Factors that cause success of Govt digitization projects

## 6 Conclusion

With all the findings gathered and discussed in the previous chapter, we can clearly conclude a number of facts that were earlier presumed as possibilities, including some that were contrary to common understanding.

- First of all, Political government has the highest influence in the model of governance, however, to curb its power it is set to be temporary and may change from time to time.
- Bureaucracy on the other hand is permanent and it is the steel-frame of governance that is there to last.
- Political government influence legislation that is put forth to the executive body for execution and implementation.
- Thus, political government may have more influence over new ideas, since its powers to shuffle bureaucracy, thus new ideas are happily entertained from them.
- Yet, bureaucracy is what is responsible for the execution and sustaining these ideas that come from the political government.
- When political government changes or senior bureaucracy shuffles, it affects the ongoing government programs.
- If bureaucracy is not willing to sustain a program, it cannot demand compliance from its working staff and thus the program slowly dies out.
- There are times when a program is contingent on funds, particularly programs that were initiated by foreign donor funds. Programs as such are completed but are expected to be sustained by the country. Such programs often fail for they may not get resources allocated to them for sustainability.

- In the end, all factors are contingent on these few significant factors that may positively or negatively affect the overall success of government digitization programs.

## 7 Recommendations

In synthesis, these are some recommendations that need to be considered when planning new programs.

- There needs to be strong buy-in from political government about ideas of government digitization.
- There needs to be strong buy-in from the bureaucracy and its willingness to sustain the program long-term.
- Enough funds ought to be allocated to the program or strong business development needs to be in place to sustain the program long-term.
- The total combined strength of these three factors will determine the overall success and sustainability of government digitization programs.

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## Appendix A

1 Example of the Questions in the Questionnaire

How significant on a range from 0–9 (lowest to highest) are these factors for causing Failure of Government Digitization?

- Change in Political Government 0–9
- Transfer of Senior Government Officers 0–9
- Financial Constraints 0–9
- Red–tape/Bureaucracy
- Untrained Staff 0–9
- Unwilling Staff 0–9
- Old IT Infrastructure/Compatibility Issues 0–9
- Weak supporting policy 0–9
- Poor coordination among stakeholders 0–9
- Lack of interest from Donors 0–9