Reasons for the Failure of Government IT Projects in Pakistan: A Contemporary Study

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***Abstract*— After the introduction of information technology (IT), the government needs to take the initiative to start IT projects for the automation of government process to the citizen. Statistics show that a high number of government IT projects fail and only 15 percent e-government projects are successful. In this study, we will answer this research question, what are the reasons for failure of IT projects in the government sector organization in Pakistan and how to overcome these issues? This research was conducted through a literature review, 20 articles from journals and conferences were selected through keywords for the period of ten years from 2003 to 2013. For suggestions, we have followed the same structured search procedure. We found and select articles with our keywords, after reading abstract and conclusion. Our study has described four factors for the failure of IT projects in government sector organizations in Pakistan. These factors are Technology, Management, Politics and Finance. The technology factor can be reduced by providing latest ICT infrastructure with an expert to run and maintain it. Management issues can be resolved by hiring an experienced, skilled and highly motivated project manager to complete a project successfully. Government should make new laws and regulations to help the implementation of these projects and bureaucracy should eliminate any power struggle during and after the implementation. The budget should be allocated before the start of the project to complete it on time. Our research study has provided guidelines to policy makers for automation of government organizations in Pakistan. By considering these suggestions, successful government projects can be achieved.**

Keywords*— *Failure factor; IT project; ICT; E-services; E-government; Developing countries; Pakistan

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I. INTRODUCTION

After the introduction of information technology (IT), every government is trying to adopt the new changes to improve the government processes by using it to facilitate their citizens. For the adoption of these technologies, the government needs to take the initiative to start IT projects for the automation of government organizations. The automation of organization changes the infrastructure and working environment of departments and also the roles of employees. One of the purposes of the adoption of IT is to gradually automate the processes which basically change the routines from manual to digital. For digital routines, government needs to provide this environment to all stakeholders such as citizens, employees, and businesses [33]. These digital routines are also known as e-services, for example, e-ticketing, e-passport, e-identity, e-banking and e-health.

A. Failure of IT projects

Adoption of information technology can change the routines of government organizations and also improve the services [37]. Citizens are the foremost users of these services and this is why governments offer better services to them. Statistics show that a high number of government IT projects fail and only 15 percent e-government projects are successful [13] [33]. Some projects are total failures because it was not possible to implement the system, or they were abandoned soon after their implementation. There are projects which are partial failures, because in those projects major goals of the system were not accomplished and in some cases results were significantly undesirable. These failure categories range from 60 to 85 percent [12].

In the field of e-government, failure is defined as unable to achieve its goals [6]. The government IT projects failed in developing countries due to lack of internal political desire, overall vision, dominance of politics, poor management, lack of competencies and inadequate technological infrastructure [16]. The failures resulted in a substantial waste of financial, human, time and political resources which in turn lead to a failure to deliver the potential gains from e-government to its recipients. This resulted in three trillion US dollars globally spent on IT by governments excluding public health, education and utilities, during the first decade of 2000s. These problems of failure of IT projects in the government sector are the result of poor management. If the projects and processes and systems of e-government were accomplished, failure and waste of resources would be much fewer [12].

B. *Objective of this study*

The objective of this research study is to identify failure factors during implementation of IT projects in government sector organizations. Here we have also described similar types of problems faced by other countries and related their solution to our ground realities and try to advise accordingly.

1) *Motivation of choose Pakistan*

For our research study, we have selected Pakistan where automation of services is just beginning and government is in the process of computerizing its services. Pakistan had a very late start in converting its manual processes into electronic form, as the Electronic Government Directorate (EGD) was established in October 2002. As most of the processes are in its initial phase, it is important to analyze those projects or processes which failed and causing the delay [8]. United Nation e-government index value and rank also show that the failure ratio of IT projects in government organization is still very high. According to the UN survey 2012, population wise Pakistan is the sixth largest country in world and for e-government development, Pakistan is ranked 156 worldwide and the seventh place out of nine countries in Southern Asia [39]. The reasons for the delay in implementation and failure of IT projects are awareness on available e-services, citizens' lack of trust on internet and government [33]. This shows that Pakistan is still behind in the field of e-government compared to other developing countries in the world.

2) *Research Question*

After the completion of this study, we will have some issues for failure of the organizational process which affect the e-government projects. Here we will not only identify the reasons for the failure of IT projects in government sector but also gives advice to how to overcome those hurdles. After the initial search, we were unable to find any article which has highlighted issues for the failure of IT projects and gives any suggestion on this topic specifically in case of Pakistan. This provides us the motivation to highlight factors through literature which has an impact on failure of governments' IT projects in Pakistan; we will not only highlight the failure reasons but also suggest how to overcome these issues. **Research Question:** *What are the reasons for failure of IT projects in the government sector organization in Pakistan and how to overcome these issues?*

II. METHODOLOGY

This research was conducted through a literature review, because effective review provides a solid foundation for progressing knowledge. It also assists theory development, seal areas where surpluses of research exist, and identify areas where research is needed [41]. Our research study is based on a literature review according to the guidelines of Webster and Watson [41] within the ten-year period of 2003 to 2013. For this purpose, we have selected the papers from journals and conferences such as IEEE. It is really difficult to limit our scope of study to a specific geographical area, because very limited material is being found on the topic. Furthermore, Webster and Watson [41] have mentioned that a high-quality review should not focus on one geographic region. We have followed the structured approach mentioned by Webster and Watson [41]

i) Majority of the articles search was from journals
ii) Go backward by assess the citation
iii) Go forward by using Web of Science

A. *Formation of keywords and data collection*

The keywords were derived from our research question, but we have used other methods such as brainstorming, searching on internet and in library. After deciding the keywords, we made combination scheme during search where we used synonyms to expand our research to get more data related to our research question. Finally, combinations of these keywords were used to accumulate the related articles.

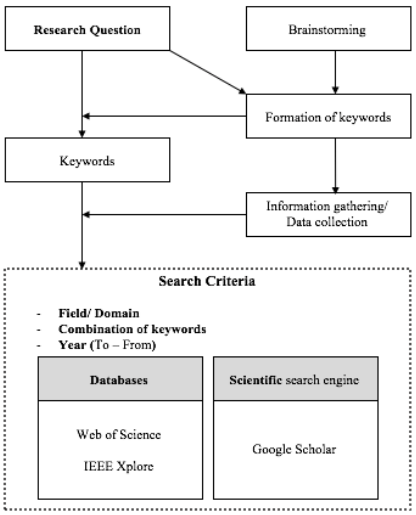

FIGURE 1 PAPER SELECTION FRAMEWORK

TABLE 1 COMBINATION OF KEYWORDS DURING SEARCHING DATA

Keywords	Result
electronic government + Pakistan	3
e-government + Pakistan	4
IT Projects + Failure + Pakistan	3
Government Projects + Failure + Pakistan	2
Project Failure + Pakistan	12
Government + IT Projects + Pakistan	1
IT services + Failure + Pakistan	8
Total	**33**

For searching of data on digital library, we have formed different combination of keywords, which has optimized the search relevant to our research question and specific duration of 2003 to 2013. We wrote that combination of keywords that have searched articles during specific duration. Table 1 show that initially we found 33 articles; out of those we have selected 14 articles, 7 each from Web of Science and IEEE Xplore. After reading title, abstract, and conclusion, only those articles were selected which have failure factors in the field of e-government and belong to Pakistan. Here we have left all those articles which don't match with our scope of study; mostly those articles were related to medical sciences. Rest of the six articles were selected from Google scholar by using same keywords combination, against the key words Google scholar usually gives a lot of hits but our selection of article's criteria was the same.

1) Paper searching criteria for suggestions

After completion of search process and analysis of collected data for the failure of government IT project in Pakistan, we move forward to suggestion phase, for this we followed the same structured search procedure but we found 99 articles with the following combination of keywords on Web of Science, "*Successful*", "*government*", "*IT projects*" and "*developing countries*". After reading abstract and conclusion of all the papers we have selected only nine papers which belong to the similar problems occur during implementation of government IT projects as in Pakistan. We have excluded rest of the articles which were not related to the scenario of Pakistan. So, in the light of collected papers for suggestions, we have given suggestions through literature, how to overcome four factors presented during failure of government IT projects in Pakistan.

For data collection process and paper selection framework, we have established initial concepts from Islam and Scupola information source selection model [18]. This systematic search has guaranteed us that we have collected a relatively whole sample of related articles [41].

B) Data Analysis

For analysis of collected data, we have used Grönlund and Andersson [10] clustering and theory creating method and Webster & Watson [41] concept concentric approach. After reading title, abstract and conclusion, initially we wrote the failing factors from all the articles; in the second step, we grouped them according to the similarities among them and in the third step we have found more stable relationship among them. For suggestions, we have selected the articles from developing countries those who have similar political background, and infrastructure as compare to Pakistan to suggest or advice according to their success story.

III. RESULTS AND ANALYSIS

Although, initially, our criteria were to select articles for the period of last 10 years, but due to very specific and precise research question we happened to find the oldest paper from 2007 and newest from 2012, which indicated that this data is only for the period of these five years, although this was not our intention.

After reading these twenty articles, we have come up with four major factors with the process of clustering and theory creating method as mentioned by Grönlund and Andersson [10]. After reading abstract and conclusion of these articles, firstly we wrote all the failing factors mentioned in these articles and we grouped them according to the similarities such as IT infrastructure, financial, internal and external politics, and factors related to management. Secondly, after finding the similarities we have found more stable relationship between these factors by organizing them into a tabular form.

Some of the articles mentioned one problematic factor while others highlighted more than one for example, Hayat and Alam [11] have mentioned three major factors those which influence the success of IT project in government sector. These factors were poor or lack of ICT infrastructure, lack of legislation to support new electronic government development and processes, and lack of political will to make government processes electronically and socially sensitive [11].

- ***Technology issue:*** We have got issues such as ICT infrastructure, data lost, lack of skilled IT professional, security issues which could be attacks of hackers on governmental websites and services. Hayat and Alam [11]; Henriksen and Andersen [15]; Kayani et al. [21]; Kayani et al. [22]; Kazmi [23]; Qaisar and Khan [32] have talked about limited success of implementation of new technology due to poor IT infrastructure. Bano et al., she has identified that change of requirements during life cycle of a project is one of the failure factors [4]. Lack of IT skilled personal and lack of IT security are the issues mentioned by Ashraf et al. [3]; Kayani et al. [21]; Kayani et al. [22]; and Shah et al. [36].
- ***Management issue:*** Arfeen and Khan have mentioned that governance, political issues and human problems are difficult to solve [2]. Gandapur et al. mentioned lack of quality management system and absence of identifying risk management factors during a project are cause of failure [9]. Management issues includes legal issues, lack of time management, right person for project manager job, and some time change of requirements of top management during a project are the issues highlighted by Arfeen and Khan [2]; Hussain [17]; Jalil and Shahid [19]; Kayani et al. [21]; Kayani et al. [22]; Kazmi [23]; Mohmand and Cheema [27]; and Naqvi et al. [29].
- ***Political issue:*** Politics is one of the key issues we have mentioned which include internal political issues as well as external political issues, slow bureaucratic process and instability in political environment, Arfeen and Khan [2]; Hayat and Alam [11]; Shafique and Mahmood [35]; Shah et al. [36]; Watson and Khan [40]. Ashraf et al. have pointed out that instability of political environment is one of the key issues of failure of IT projects in government sector [3]. Henriksen and Andersen; Mohmand and Cheema have mentioned struggle of power and control between the bureaucracy and politicians as one of the hurdles [15] [27].
- ***Financial issue:*** Finance is the last major issue**,** which we have mentioned**,** it is related to financial budget for example lack of it and some constraints due to poor

economic status of government, Ashraf et al. [3]; Khan and Zhang [24]; Qaisar and Khan [32]; Shafique and Mahmood [35]; Watson and Khan [40]. Khan and Zhang [24] have mentioned that implementation of e-government projects need capital investment as well as funds for operation and maintenance for IT projects, lack of funds make it hard for any IT project to complete first and then stay operational [24].

From these twenty articles, breakdown of the factors is stated below in table 2. It is also evident that one IT project may have more than one factors responsible of failing it or make it partial failure. We have defined table 3 in discussion section with detail.

TABLE 2 BREAKDOWNS OF THE FACTORS IN PAPERS RELATED TO IT PROJECTS IN GOVERNMENT ORGANIZATIONS IN PAKISTAN DURING 2003 TO 2013

IT Project Failure Factors in government organizations			
Technology	**Management**	**Politics**	**Finance**
10	11	8	6

A. Suggestions

We have presented the reasons for failure of government IT projects in Pakistan here we have suggestions from successful implementations of government IT projects in developing countries and how they remove the failure factors from their IT projects in government organizations.

- ***Technology factors:*** According to Ebrahim and Irani [7], network capacity and communication infrastructure is important for the successful implementation and integration of IT services in government organizations [7]. So, before implementation of government IT project, we need to establish a communication infrastructure and then move forward to start e-government services which facilitate the citizens in terms of reliable and effective services. Existing ICT infrastructure and ICT expertise are very important for government IT projects to achieve the goals. ICT expertise provide the support and also refine, adjust the organization requirement during adoption of e-government and it is capable of increasing the capability to implement IT project. Available IT infrastructure of organization and IT expertise skills are linked with the integration and successful implementation of IT projects [31].
- ***Management factors:*** Failure of government IT projects can be occurred due to poor management. So, before the implementation of software in organization it is needed to be tested. Project manager should provide training facilities to the users of a system [1]. For government IT projects, to be successful, effective project management is required because project manager defines responsibilities, planning including risk management, time management, monitoring and control system, and organizes resources [16].
- ***Politics factors:*** Government's lack of political will also causes the failure of IT projects in government organizations. Most of the governments in developing countries do not consider ICT development a priority and during implementation of IT projects they may transfer the government employees who are working on key positions in a project. Mainly the project was implemented by state bureaucracy and sustainable support by politicians and officials. For successful implementation of IT projects, focus should be on a role of political body, administration and contribution of the employees for the modernization of government organizations. Local administration and political actor needs to be involved, otherwise the chance of failure will increase [5] [20] [28].
- ***Financial factors:*** Finance is critical factor for implementation of government IT projects. IT projects in organizations, need government initiative about resources, long term planning and required huge investment in early stage of a project. In developing countries, financial resources are very important because of their limitations. So, for the successful implementation of IT projects, first they need to get some funding by proper financial plan and made some partnerships with international donors and businesses before taking initiative of project. International bodies also play an important role in implementation of e-government projects in developing countries in term of funds and IT expertise [38]. Kim has suggested an independent financial system for every public agency by providing real time financial information to high level government employees [25].

IV. DISCUSSION AND CONCLUSION

Our study has identified four factors for the failure of IT projects in government sectors in Pakistan. Table 2 shows that out of 20 articles, 10 have mentioned technology as a factor for failure of government IT projects. If we further breakdown the technology factor IT infrastructure and lack of IT skill personals are found to be major issues. In developing countries like Pakistan where bureaucracy has a major role in development of any government project, but due to their slow official procedures sometimes it is difficult for project manager to maintain the pace with rapidly changing IT technologies. This becomes more complex sometimes where user requirements change in the middle of the project.

IT infrastructure includes hardware, networks, software, and technical skilled personals. Hardware can be ordered and installed in days but it is software which takes months to complete. This should be considered and be well planned before start of any project. To deal with such issues, one has to be proactive and must plan in advance according to the current situation. Proper technical education is a must and one should hire a skilled person for a technical job above all favouritism. When we have a skilled person for a job it will not only omit the ineffectiveness but also increases the efficiency for the job one has held responsible for.

Project manager is key person; he has to be experienced and proactive in his job. His job is to control, to manage it well and to execute it in such a way that it produces desire set of goals [36]. Poor project management is one of the reasons of IT projects failure; in management issue, we also included legal issues. When new e-services are being developed we often need our laws to change accordingly. If these situations are addressed in time we could finish our projects in desired duration without delays. Project manager has to deal with problems like unclear objectives, time lapses due to any reason and has to manage risk management issues before hand.

Project failure some time hit by political instability, this is cause of frequent government changes due to any reason (which is outside the scope of our study), new head of state might not like the project or change the project according to his interest. Departmental politics some time internal and sometime external politics with other departments cause the delay which ultimately causes the financial problems to the projects. Power and control is one of the issues which is being created by these IT projects, usually bureaucracy do not want to lose its grip on procedures and routines, because of the automation they have to sacrifice their control and power on these routines.

The suggestions which we have taken from the developing countries have almost same situation as in Pakistan, when we talk about lack of skilled person for a technical job, we learn from our suggestions that project manager can help and build a team of skilled personals by providing them the required training for their respective jobs. Usually project was implemented by state bureaucracy and sustainable support by politicians and officials, previous study cannot suggest if any of these actors use his or her influence to alter the project to his or her interest as mentioned in results. Politicians usually do this kind of thing to increase their vote bank. We learn from the experience of other developing countries and overcome the issues like poor ICT infrastructure, lack of ICT expertise, change requirements, lack of IT security by using new available technology which increase the chances of establishing network and enhancing communication infrastructures, skilled ICT expertise in IT projects provide support and continuously adjust the needs of organization for implementation and integration of IT projects. Previous research shows that successful implementation of IT projects can be achieved by the employees who have technical knowledge and skills. Large IT projects usually need substantial financial support, previous researches does not suggest how to get financial support for these large government IT projects.

We have identified four factors from the literature which mostly causes the failure of IT projects in government sector in Pakistan. These factors are Technology, Management, Politics and Finance. Furthermore, we have also studied the literature in which these problems were addressed and solved successfully in developing countries whose ICT infrastructure, management, political and economic situation is similar to Pakistan. According to this literature, we have drawn a conclusion that above-mentioned failure factors could be resolved in Pakistan by the following strategies:

- The technology factor can be reduced by providing latest ICT infrastructure with an expert to run and maintain it.
- Management issues can be resolved by hiring an experienced, skilled and highly motivated project manager to complete a project successfully.
- Government should make new laws and regulations to help the implementation of these projects and bureaucracy should eliminate any power struggle during and after the implementation.
- The budget should be allocated before the start of the project to complete it on time.

Our research study can provide guidelines to policy makers for automation of government organizations in Pakistan. The policy makers can suggest hiring experts for a project and providing latest technology. Politicians should do all the necessary legislation which can help the project during and after its implementation. By considering these suggestions, successful government projects can be achieved in Pakistan.

V. LIMITATION OF THE STUDY

Due to time constraint and limited number of articles, we are able to find only four factors which cause the failure of IT projects. If we have more articles we might be able to find more than four factors which cause the failure. Face to face interview from an IT project team may draw a different picture. For suggestions, we have also found limited material from developing countries. Most of the papers highlight the challenges, success and failure of e-government in developing countries without clear suggestions or advices

VI. FUTURE STUDY

This study highlights reasons for failure of IT projects in government sector organizations in Pakistan and also suggests how to overcome these failure factors through literature study. For further study one can highlight technical, economic, social, cultural and political perspective of automation of government organizations through face to face interviews of government IT expertise, practitioners and research groups during implementation of government IT projects. There is lot of work to be done on this topic because very limited research material is available in context of Pakistan.

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