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A framework for eGovernment project success: an exploratory study using systematic literature review and empirical investigation

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Abstract: The paper addresses various eGovernment challenges in developing countries. A review of the literature on eGovernment challenges and their validation using empirical investigation is presented, and a number of research gaps and future directions are identified. The purpose of this study is to provide a framework for future researchers and practitioners. We present a significant conceptual framework for eGovernment project success, integrating theoretical and the practical domains. The framework incorporates antecedents, postcedents and the outcome. Five antecedents are organisational, managerial, operational and environmental, technical and social aspects; encompassing 21 critical factors. The two postcedents are improved service and the customer satisfaction, and the outcome of eGovernment is its success and the competitive edge. Additionally, research gaps and vital eGovernment subjects are identified. This study provides a valuable discussion on major eGovernment challenges and provides a conceptual framework for implementing the project successfully, along with several suggestions for future eGovernment research.

Keywords: barrier; challenge; developing country; eGovernment; eGov; public sector; implementation.

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1 Introduction

The importance of eGovernment (eGov) has been realised worldwide, and a number of countries are progressing towards better eGov initiatives (Mergel, 2016). eGov incorporates high level services, transforms government services to be more transparent, efficient, effective, and accountable at a reduced cost within the public sector (Alghamdi and Beloff, 2016; Matavire et al., 2010; Andersen, 2006). The eGov's recent progress has created new potentials to achieve this goal (Anna and Kei, 2005). eGov assist in increasing citizens' trust and their confidence in government services (Hossain et al., 2011; Chen et al., 2006).

eGov is defined as: "Information technologies...that have the ability to transform relations with citizens, businesses, and other arms of government... [and] can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management... benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions" (Hee, 2007).

eGov will be among the most exciting domains in the near future (Anna and Kei, 2005; Fang, 2002). It is considered to be a major milestone in the success of any country with respect to information and communication technology (ICT) (Wilson, 2014). Such varied and complex nature of eGov initiatives implies existence of several challenges such as poor ICT infrastructure, poor security, lack of management support, less collaboration, lack of resources, training issue, culture and high costs, etc. (Mergel, 2016; Matavire et al., 2010; Andersen, 2006; Anna and Kei, 2005). The mentioned challenges hamper the progress of the eGov initiative and have negative affect on the development (Mergel, 2016; Matavire et al., 2010).

Several research articles in eGov field have investigated the factors that may influence the eGov effectiveness (Matavire et al., 2010; Andersen, 2006; Anna and Kei, 2005). Despite the fact it is crucial, existing research offers little insights into an extensive and integrated picture of eGov challenges (Mergel, 2016; Anna and Kei, 2005). The researchers and practitioners must put additional effort and consider different major concerns in eGov projects, such as effective management, proper training, better infrastructure, good communication and collaboration, and efficient resources, to improve the quality and effectiveness of the project (Anna and Kei, 2005). The eGov projects are basically software projects, however, differ from traditional software projects and therefore face different challenges. The difference with respect to context occurs due to

fundamental differences in ownership, funding and control (Heeks, 2003). The objectives of project, roles and responsibilities, nature of project development is different in eGov sector. Consequently, eGov encompasses a broader context in the software development and implementation. Many eGov studies exist for eGov challenges having different focus, i.e., management issues (Huang and Bwoma, 2003; Ramon and Pardo, 2005; Nawi et al., 2012), technical issues (Ramon and Pardo, 2005; Hwang et al., 2004; Yadav and Singh, 2012), organisational issues (Ramon and Pardo, 2005; Nawi et al., 2012), financial issues (Alshehri and Drew, 2010a) and social issues (Signore et al., 2005) as separate topics. However, a comprehensive understanding of what major challenges does developing countries face, how do they affect the eGov implementation activities, and what challenges are considered critical in practice is still limited and remains largely unexploited (Mergel, 2016; Chen et al., 2006). Therefore, in order to fill this gap, we carried out a systematic literature review (SLR) and the empirical validation of the eGov challenges and barriers in developing countries. We used the review protocol, to assemble the published research evidence in the eGov field. This study arranges these challenges in a distinct taxonomy as well. The identified challenges have been validated from the industry using interview method, and critical challenges are reported as well.

In summary, this SLR and the empirical study intend to abridge and simplify the existing literature and the real-world scenario regarding:

- 1 the existing eGov challenges
- 2 real-world critical challenges.

A total of 78 studies were selected for our SLR. Interviews were conducted to identify whether those challenges exist in practice and how significant are they. A number of research gaps have also been stated and discussed: there is a need to understand eGov challenges properly before starting system development; more real-world environments' research need to be conducted; specific management practices that can help to minimise eGov challenges and to execute the eGov projects successfully; and comparative studies for execution of the eGov initiative.

The results of this study provide a conceptual framework for better eGov practices and evidences for future research directions for improving eGov practice by considering key challenges. The framework gives sound concern to major eGov barriers and their investigation, that would be quite promising direction to the eGov success. In addition, the study provides an improved taxonomy of identified challenges. Moreover, it gives a conceptual and a general understanding of eGov issues for academia. Furthermore, it contributes to the real-world eGov practices, giving eGov managers some awareness about the practical implications.

The rest of this paper is structured as follows: Section 2 presents the motivation for this study. Then, we provide the research contribution in Section 3. Section 4 offers the overview of related work. After that, the methodology for our study is defined (Section 5), followed by the results of the study (Section 6). Section 7 concludes the work and gives future directions.

2 Motivation

eGov area has progressed significantly since more than 20 years of research period. This eGov research development has provided a number of results in terms of eGov facilities, potentials, benefits, and practices as have been reported in a number of relevant journals and conferences (Mergel, 2016). A huge quantity of research is in progress on various eGov topics. Any new researcher in this domain needs to gain a sound understanding of the current state of the eGov challenges and research trends, and to get the knowledge of the future research prospects in this domain. Few studies are available in which researchers report the issues faced in eGov initiative in an integrated manner. However, these attempts' had limited focus, and lacked empirical evidence (Hee, 2007; Wilson, 2014; Ramon and Pardo, 2005).

An effort to aggregate the relevant eGov studies and an empirical confirmation regarding the challenges is required to present a state-of-the-art of the field (Kitchenham and Charters, 2007). Therefore, a SLR and extending it to the real-world environment, presenting in-depth analysis of the eGov challenges would contribute a lot to the field.

Another motivation to conduct this SLR and real-world investigation is that no study on government challenges is available previously, which validate the results of the literature. Our study is comprehensive and is analysed in more depth and detail, following procedure given by Kitchenham and Charters (2007). Furthermore, the earlier studies revealed only fewer eGov challenges and the verification of the critical challenges from industry is missing. As the domain is progressing day by day, this study directs to more subjects, allowing more conclusions to be drawn.

3 Research contribution

A conceptual framework for eGov success has contributed to the field of theory and practice. Motivated by a study on research directions for government challenges (Dada, 2006), an SLR and an empirical investigation of major critical challenges has been provided respectively. SLR follows the guidelines given by Kitchenham and Charters (2007). The study presents the state-of-the-art of eGov challenges in developing countries, filtered a huge collection of relevant studies, and extracted required data from eGov research, conveying its challenges, to gain an overview of eGov implementation in the developing world. Additionally, the identified challenges have been verified by the practitioners and the study specifies the critical challenges within the domain. Moreover, this study presents trends and opportunities of the eGov domain. The proposed framework can be helpful to the researchers and practitioners identify major significant factors lacking ample consideration, and to focus on those critical challenges. Moreover, the analysis and conclusion can be regarded to be of special importance to eGov managers. Such as:

- 1 the managers can get an idea of critical social, organisational and managerial factors which improves customer satisfaction
- 2 they can be aware of the aspects that reduces costs and increases success rate.

4 Related work

In the process of our literature search, we found some informal reviews in the eGov challenges domain. Comparatively, this study is comprehensive as it highlights numerous areas of concern such as, eGov challenges, and their taxonomies. The identification of the critical challenges has been performed as well, based on the interviews conducted with the practitioners. Moreover, the study follows a well-defined procedure and validates the information using empirical verification process. The details of earlier identified literature reviews are given in subsequent paragraphs.

A study conducted by Heeks (2003) provides the analysis of design-reality gaps in eGov. He states that most of the eGov projects fail due to the design-reality gaps. The paper focuses on reviewing the issue of design-reality gaps and its seven dimensions along with the peculiarities of those dimensions. The study provides guideline to identify and address eGov project risks. A real-world case study was assessed using the design-reality gap approach to reduce risks in an eGov project, to depict the value of such gap in an improved way. The limitation of the study is that it presents an informal review of government failure types, and is not describing the gap reductions of the case comprehensively

In another review study conducted by Rahimy (2016), research done on the adoption and dissemination of eGov system is discussed. In addition, the study states that benefits, social influence and external pressure are highly related to adopt eGov services. The awareness among users needs to be enhanced to progress. The study also found some strategic and technical challenges that affect eGov development. The study contributes by identifying the eGovernment business application types, and the degree of usage of those applications. An informal review of literature related to eGov development applications is performed. The study does not provide suggestions comprehensively, and is discussing business type only.

The study by Alshehri and Drew (2010a) states that eGov execution is not easy. The study gives a thought provoking overview of existing challenges in eGov development such as financial, social and organisational barriers. Among these, some of the issues are: 'ICT infrastructure', 'privacy', 'security', 'top management support', 'collaboration', 'lack of qualified staff', 'lack of training', 'high cost', etc. Based on the literature, the study shows a number of related problems about eGov such as definition of eGov, execution stages and eGov implementation advantages. The technique used by the study is a review of the available literature of eGov stages, the issues and benefits in implementation. The study does not follow proper protocol for review and lacks to provide a comprehensive list of issues that come in way of eGov.

In a study by Yildiz (2007), discusses the limitations in eGov literature. It critically analyses the definitions and development stages of eGov concept. Moreover, the study discusses the limitations of the concept. It provides some methodological remedies to overcome limitations, such as:

- 1 improved examination of the processes of eGov projects within complex environments
- 2 address the problem of eGov policies
- 3 incorporate eGov concept strongly to public administration.

A short and informal review of literature is conducted on the vagueness of eGov definitions, the complexity in development process and some limitations in eGov approaches. The study consists of a narrow description of eGov limitations, and lacks major critical points.

Another study by Gichoya (2005) assessed few case studies from some countries (developed and developing both) to get a small sight of real world eGov challenges. The study offers an overview of current challenges in developing countries such as lack of management support, system quality, infrastructure issue, lack of skilled team and resources, etc. The study proposed a conceptual framework based on the literature and the case studies data, depicting some input and output variables that define the eGov success. A qualitative research approach based on case studies literature was used to identify and analyse information. The study was an informal literature review, and included only one developing country for preliminary study.

In a study by Dada (2006), describes the gaps and eGov failure types. The study uses the models discussed by Heeks (2003), for categorising the failure types and describes why so many initiatives in developing countries fail. The paper concludes with the description that the main reason for eGov failure in developing areas is the gap between the actual and the built system. The study classifies literature and adds to the subjected area with the fact that the practitioners must understand the context in which the eGov development is carried out. A literature review of eGov failure types and gaps in developing countries is conducted. The study presents an informal literature review and lacks several various important aspects.

A number of reviews were available, however, in our initial efforts for the literature search, a convincing work encompassing the validation of the identified content is missing in the eGov domain, which encouraged us to conduct such an in-depth and formal SLR along with the empirical investigation.

This current study uses a systematic approach to search and report the available literature for eGov challenges. Investigating all related data for eGov major challenges are therefore required, so that possible research gaps could be identified. In addition, supplementary work has been performed, i.e., identification of challenges in real-world scenario. Moreover, a framework has been proposed and validated using expert views.

5 Research method

The theoretical framework for the methodology used in this study is given in Figure 1. The framework consists of two phases; the theoretical domain (SLR study) and the application domain (interviews). In the theoretical domain, the methodology proposed by Kitchenham and Charters (2007) was adopted.

Referring to Figure 2, the SLR protocol consists of six steps specified as: 'research questions', 'search strategy design', 'data extraction results', 'scrutiny', 'quality assessment (QA) criteria' and 'data synthesis'. Research questions were created grounded on the study's aim in the first phase. Using the research questions, search strategies were formulated consisting of selection of literature sources and identification of search terms in the second step. The third phase consisted of the collation of the extracted information, whereas the fourth phase focused on the refinement of the extracted information (studies) by analysing the titles and abstracts of collected papers to make sure its relevance. The scrutinised research papers were assessed by applying the 'QA criteria' in the fifth step.

And the sixth phase helped to select the final studies which were used for analysis and consequent activities.

Figure 1 Theoretical framework for research method (see online version for colours)

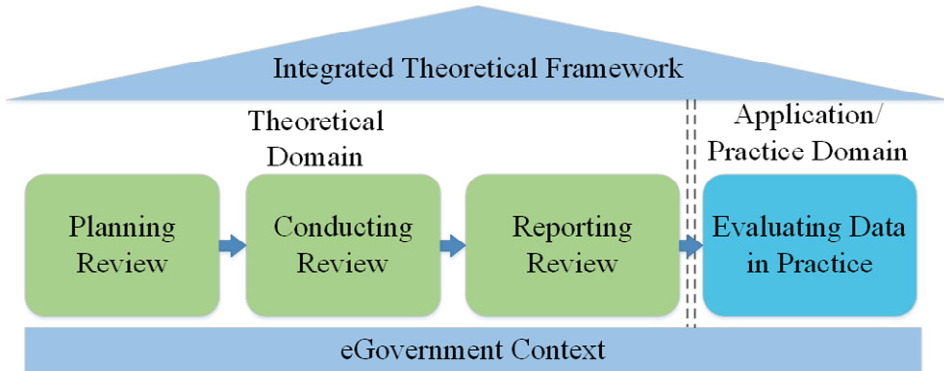
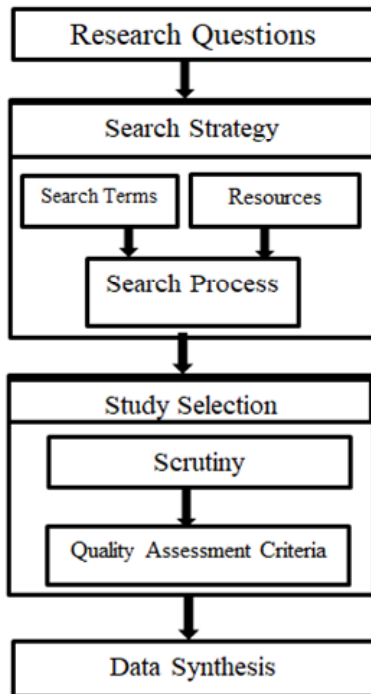


Figure 2 Phases of review protocol



In the application domain, the interviews with the eGov practitioners were used to collect the relevant information regarding the eGov challenges and their importance. Interviews are considered to be a more common method for qualitative research. They help to better understand and explore the research subject and the experiences. The interviewee consisted of the personnel from the vendor organisation and the client. The analysis is

performed using the mean value to assess the significance of the challenge, and the percentage was calculated accordingly to find the criticality of the particular eGov challenge within the practical field. The major critical challenges have been identified and specified accordingly.

5.1 Research questions

The objective of this study is to comprehend and summarise the evidences as state-of-the-art eGov challenges and to find the major challenges in practice and to identify topics for further research within the context. Three questions were formulated, two answered using SLR and the third based on the interviews:

- RQ1 What are the existing challenges in eGov implementation in developing countries?
- RQ2 Where does each issue belong to the taxonomy of eGov challenges?
- RQ3 Which eGov challenges are critical in practical field?

5.2 Search strategy

The search strategies comprised of search terms, literature resources and search process. The complete description of these three is given below.

5.2.1 Search strings

To build the search terms, steps proposed by Kitchenham and Charters (2007) were used:

- Derivation of major terms from the research questions.
- Identification of alternative spellings and synonyms for major terms.
- Identification of keywords in relevant papers or articles.
- Usage of the Boolean OR to incorporate alternative spellings and synonyms.
- Usage of the Boolean AND to link the major terms.

The final search terms derived by using above mentioned steps are as follows:

- ‘eGovernment’ AND (‘issue(s)’ OR ‘challenge(s)’ OR ‘barrier(s)’ OR ‘risk(s)’ OR ‘problem(s)’) AND (‘implementation’ OR ‘application’ OR ‘execution’) AND (‘cause(s)’ OR ‘reason(s)’ OR ‘source(s)’ OR ‘root(s)’ OR ‘basis’) AND (‘penalties’ OR ‘consequence(s)’ OR ‘result(s)’ OR ‘effect(s)’ OR ‘influence(s)’ OR ‘implication(s)’) AND (‘developing country’ OR ‘developing nation’ OR ‘emerging nation’ OR ‘third world country’).

5.2.2 Literature resources

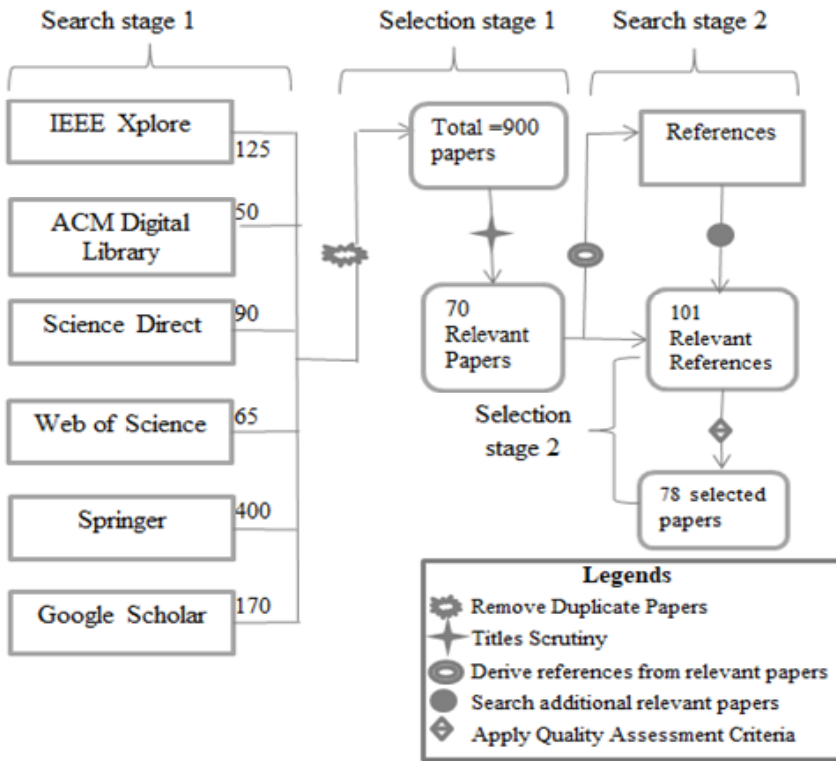
Electronic databases that were used to find relevant data for this study included: IEEE Xplore, ACM Digital Library, Science Direct, Web of Science, Springer and Google Scholar. The title, abstract and key terms was used to perform search process for published journal papers, the conference proceedings, and any symposiums/society article or workshop paper.

5.2.3 Search process

SLR deals with a comprehensive exploration of all relevant sources regarding the subject under discussion. The search process used for this study comprised of the following enumerated steps. The steps are depicted in Figure 3:

- Search stage 1 A thorough search was used on the relevant database sources and the resultant papers were gathered assets of potential papers.
- Search stage 2 The references of all relevant papers were scrutinised to identify some more relevant papers and then, if any, combined those with the papers assembled in Stage 1.

Figure 3 Search and selection process



5.3 Study selection

The first search stage helped to identify 900 prospective studies. Then, duplicate papers were removed. After removal of duplicate studies, 300 papers were left. Then, the titles and abstracts of those papers were used to scrutinise and gather appropriate studies. These steps were necessary to eliminate duplicate and irrelevant studies. As a result, 70 relevant studies were selected. Afterwards, references of each selected paper were examined. It was done to find some more important studies that might have been missed out previously. This task led us to identify 31 additional studies. This took the count of

selected studies to 101. Then, QA criteria were applied to 101 studies. At the end of the exercise, 78 studies were selected and considered appropriate to answer the formulated research questions.

5.4 Scrutiny (inclusion/exclusion criteria)

The studies were scrutinised in this step. A detailed inspection was performed by exploring the contents of every paper and the inclusion/exclusion criteria (Table 1) were applied. It was done to eliminate irrelevant papers from the list.

Table 1 Inclusion and exclusion criteria

<i>Inclusion criteria</i>	
a	All papers are published in English language
b	Papers that focuses on eGovernment issues/challenges
c	Relevant papers that are published from 2000 to 2020.
d	The studies relevant to the specified search terms
e	All published papers having the potential of answering at least, one research question
f	The studies representing qualitative data only
<i>Exclusion criteria</i>	
a	Papers not published in English language
b	Papers that do not address the research questions
c	'Grey papers', i.e., papers short of bibliographic information such as volume and issue numbers, publication date/type were excluded
d	The studies not having any relevance to the stated search terms
e	Duplicate papers are omitted
f	The studies representing quantitative data are excluded

Precisely, this SLR is performed, to identify eGov challenges that inhibit successful implementation, on studies published from 1 January 2000 to 31 December 2020.

5.5 QA of selected studies

The scoring method helped us to complete the QA of selected studies. It helped to find relevant studies capable of addressing each research question.

Some QA questions, presented in Table 2, were formulated to gauge the credibility, completeness and relevance of the selected studies. Each question had only three options for answers: 'yes', 'partly' or 'no'. These three answers were scored as follows: 'yes' was considered as score 1, 'partly' considered as score 0.5 and 'no' had 0 score. Therefore, the total quality score for a specific study was calculated by taking the sum of all the scores of the answers to QA questions. The authors discussed all discrepancies in the QA results. The aim of this discussion was to reach a consensus. The reliability of the findings of this review was assessed by considering the relevant studies only with an acceptable quality rate, i.e., quality score of 2 or greater (50% of the total score).

Table 2 QA questions

<i>Sr. no.</i>	<i>Question</i>
1	Are the aims of the research clearly described?
2	Is the study supported by sufficient literature review?
3	Is the issue/challenge(s) clearly explained and supported by sufficient data?
4	Have authors explicitly addressed limitations of their study?

As a result, final papers were reduced to 78 relevant studies. Table A1 of Appendix depicts the quality scores of the selected studies. These metrics directed towards the understanding of the findings of the selected studies and helped to determine the validity of the implications. It helped in determining the credibility and clear synthesis of outcomes as well.

5.6 Data synthesis

The aim of these measures was to summarise evidence from selected papers in order to address the research questions. The qualitative data were extracted in this study. To synthesise data, 78 selected studies were further examined to gauge the complete contents of studies, respectively, with respect to the criteria defined in Table 3. The selected studies with their respective references are given in Table A2.

Table 3 Contents' assessment criteria

<i>Selected study</i>	<i>Description</i>
Identification of study bibliographic references	Unique identification number for the study, publication year, title and source.
Type of study	Journal, conference papers and any society published ones.
Study focus	Domain topic, challenges/problems, eGovernment categorical issues, eGovernment objectives.
Research method	Case study, survey, experience report, action research and exploratory research.
Data analysis	Qualitative data analysis.
Application domain	Description of the perspective (context) of the study. For example, industrial setting or academic setting.
Constraints	Identification of the weaknesses in study and areas for further research.

The details regarding data synthesis are presented below.

Data related to RQ1 was prepared in a comprehensive way. Visualisation tool such as bar-chart were used to represent the various eGov challenges' distribution. In RQ2, taxonomies of the eGov challenges were identified, created and depicted using a descriptive diagram.

For RQ3, interviews were conducted with the eGov practitioners to investigate whether identified challenges exist in practice or not and which are the critical ones. The results are shown in tabular form. Accordingly, a conceptual framework has been developed for the successful execution of eGov initiatives.

5.7 *Threats to validity*

The publications' biasness and incorrect abstraction of information were considered to be the main threats in this review protocol. The studies were selected using the search strategy discussed before which included:

- a a number of literature databases
- b selection criteria
- c QA criteria.

The key terms related to the stated research questions were used to identify relevant studies for this review. However, the possibility of neglecting important research studies exists, as all studies cannot be extracted by means of the research questions' related terms in their titles, keywords, or abstracts. To control such threat, the manual inspection/scrutiny was carried out of all references of the extracted studies. Furthermore, an accurate meaning of the selection criteria complying with the research questions was imposed to evade any improper exclusion of the chosen studies. The research papers were selected using the QA criteria carefully, and discrepancies were resolved on priority; if any. In such a way, a wide variety of additional studies were identified. However, the second envisioned threat is the publication biasness. It is a condition where progressive outcomes on eGov are more likely to be stated than adverse results. It can occur also when scholars claim that their work overtook others. It can lead to overrate the work of existing eGov activities. To minimise this threat, the publications that shared out a clear statement of challenges in eGov practice were explored and included in the list of selected studies. To end with, all the chosen studies were reassessed to find the appropriate studies. It helped to minimise the inappropriate data extraction threat.

The results are presented in the next section.

6 **Results**

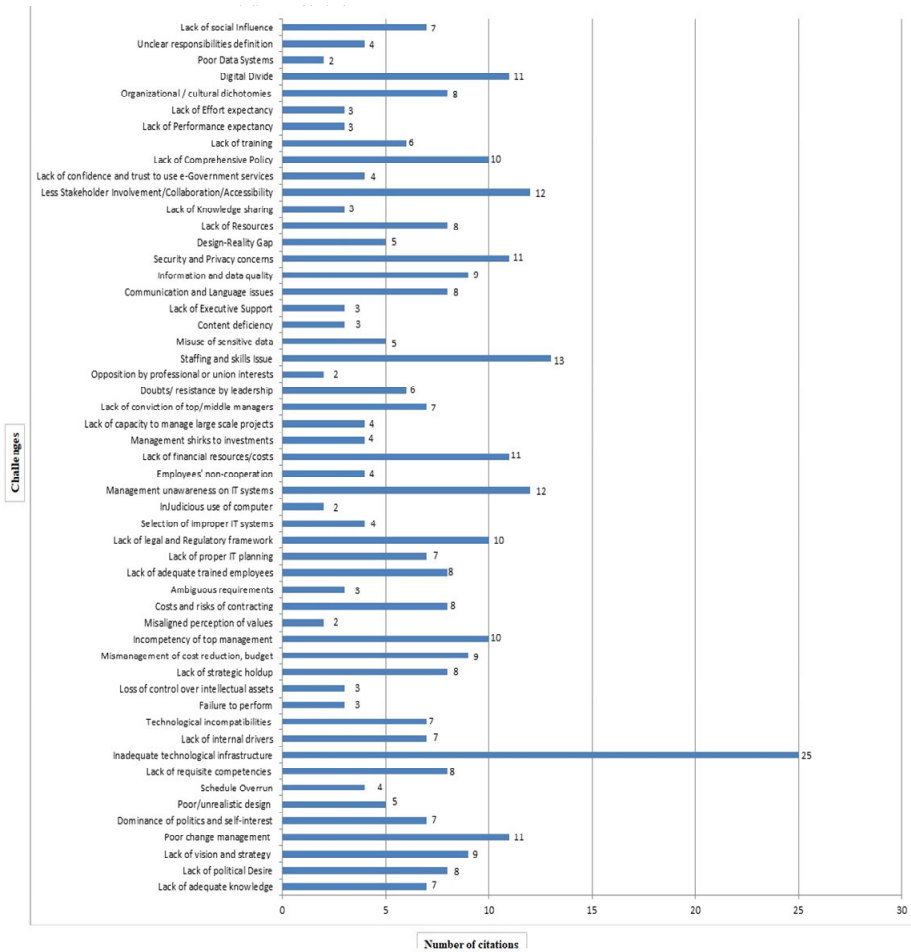
This section provides and discusses the outcomes of this research work in separate subsections. Additionally, it proposes a conceptual framework and provides suggestions for further research in the field.

6.1 *eGov challenges*

RQ1 What are the existing challenges in eGov implementation for developing countries?

Fifty-three key eGov challenges were identified from the selected studies. Figure 4 shows these challenges and their citation rates. Many researchers had made worthy efforts in the eGov field (Dada, 2006). These challenges are important to be considered and minimised, in order to prosper well in world, especially in developing countries.

Figure 4 eGov challenges with citations (see online version for colours)



6.2 Taxonomies of eGov challenges

RQ2 Where does each issue belong to the taxonomy of eGov challenges?

The overall vision that leads to the creation of this taxonomy for eGov challenges is summarised in following steps:

- 1 Initially, the identification and analysis of important and relevant government documents concerning challenges were done, which define the main problems and challenges posed in this domain. The outcome of this step was a first set of eGov challenges related terms.
- 2 Then, previous research papers that proposed categorisations of eGov issues and challenges in developing countries were identified and analysed. Challenges in developing countries were identified and analysed.

- 3 After comprehending the above first two steps, the main categories for eGov issues and risks were defined, and then were grouped in higher level government challenges.

Finally, each issue in the relevant eGov challenge category was placed, and the results are presented in the succeeding section.

Eight major categories of eGov challenges have been identified using the above criteria. These are managerial, technical, operational and environmental, financial, political, data and information, organisational and social challenges. The challenges with their respective taxonomies are illustrated in Figure 5.

6.3 Critical challenges in practice

RQ3 Which eGov challenges are critical in practical field?

To answer RQ3, we conducted interviews with 20 eGov practitioners based on the challenges identified from the literature. The resulting classification of the challenges is shown in Table 4. The data were collected from vendor (who develops the project) and client (for whom the project is developed) organisations. The number represents the amount and percentage of respondents who agreed that the challenges identified in the literature exist in the industry as well. The challenges having 75% and above are considered to be critical by the practitioners. A total of 21 challenges were found to be important at the practitioners' end. Out of those, 11 challenges got response of 90% to 100% interviewees, as they occur very often and are the most significant in the practical domain.

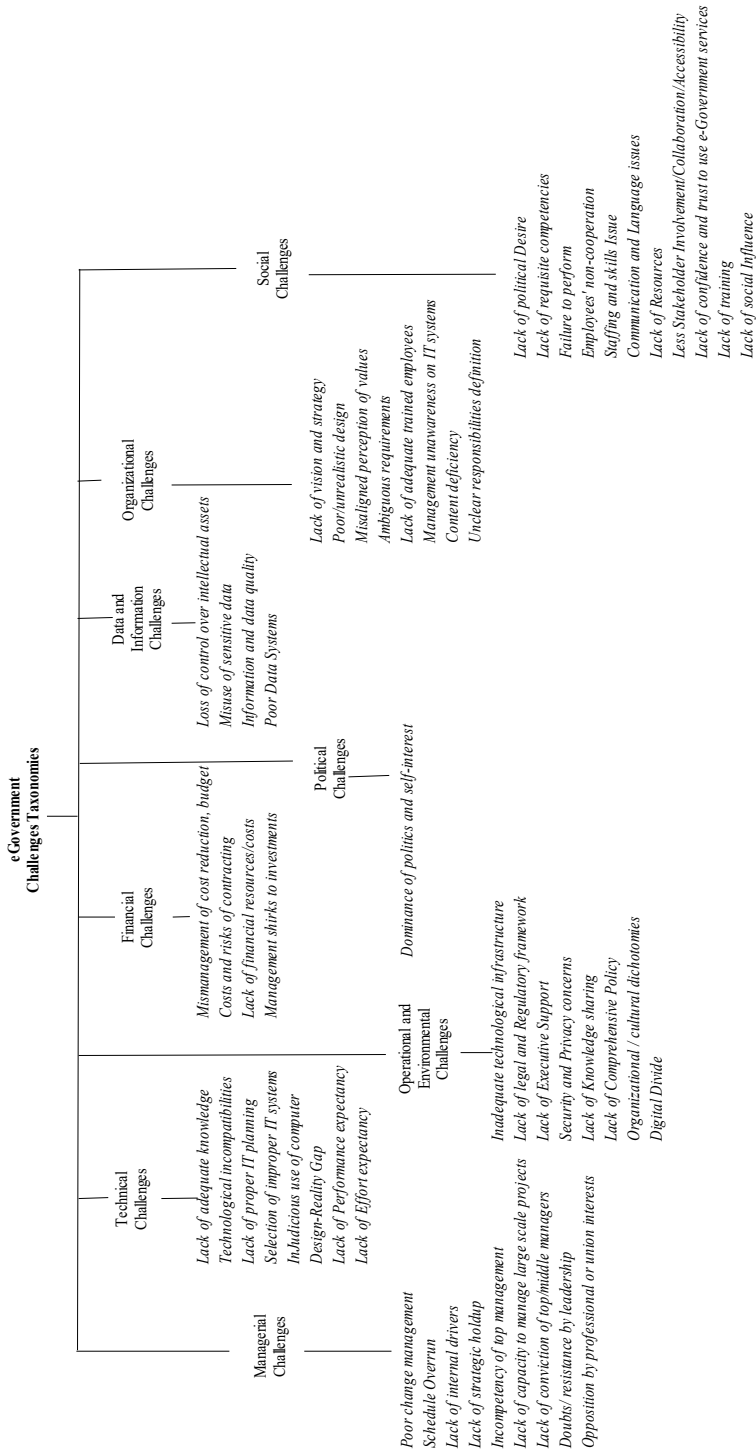
Table 4 Identification of critical challenges using client-vendor classification

<i>Sr. no.</i>	<i>Challenge</i>	<i>Client (N = 10) freq.</i>	<i>Vendor (N = 10) freq.</i>	<i>Mean value</i>	<i>%</i>
1	<i>Lack of adequate knowledge</i>	9	10	9.5	95
2	Lack of political desire	4	5	4.5	45
3	<i>Lack of vision and strategy</i>	9	10	9.5	95
4	<i>Poor change management</i>	9	9	9	90
5	Dominance of politics and self-interest	3	7	5	50
6	Poor/unrealistic design	5	5	5	50
7	Schedule overrun	4	6	5	50
8	<i>Lack of requisite competencies</i>	9	10	9.5	95
9	<i>Inadequate technological infrastructure</i>	10	10	10	100
10	Lack of internal drivers	6	7	6.5	65
11	Technological incompatibilities	6	8	7	70
12	Failure to perform	3	7	5	50
13	Loss of control over intellectual assets	3	6	4.5	45
14	Lack of strategic hold-up	8	9	8.5	85
15	Mismanagement of cost reduction, budget	4	6	5	50
16	<i>Incompetency of top management</i>	9	10	9.5	95
17	Misaligned perception of values	2	7	4.5	45

Table 4 Identification of critical challenges using client-vendor classification (continued)

<i>Sr. no.</i>	<i>Challenge</i>	<i>Client (N = 10) freq.</i>	<i>Vendor (N = 10) freq.</i>	<i>Mean value</i>	<i>%</i>
18	Costs and risks of contracting	5	7	6	60
19	Ambiguous requirements	3	6	4.5	45
20	Lack of adequate trained employees	8	9	8.5	85
21	<i>Lack of proper IT planning</i>	9	10	9.5	95
22	Lack of legal and regulatory framework	7	8	7.5	75
23	Selection of improper IT systems	4	8	6	60
24	Injudicious use of computer	2	8	5	50
25	Management unawareness on IT systems	5	7	6	60
26	Employees' non-cooperation	8	9	8.5	85
27	Lack of financial resources/costs	6	7	6.5	65
28	Management shirks to investments	4	6	5	50
29	Lack of capacity to manage large-scale projects	4	8	6	60
30	Lack of conviction of top/middle managers	7	7	7	70
31	Doubts/resistance by leadership	4	7	5.5	55
32	Opposition by professional or union interests	2	5	3.5	35
33	<i>Staffing and skills issue</i>	8	10	9	90
34	Misuse of sensitive data	5	6	5.5	55
35	Content deficiency	3	7	5	50
36	Lack of executive support	3	9	6	60
37	Communication and language issues	8	9	8.5	85
38	Information and data quality	7	7	7	70
39	<i>Security and privacy concerns</i>	8	10	9	90
40	Design-reality gap	5	9	7	70
41	<i>Lack of resources</i>	10	10	10	100
42	Lack of knowledge sharing	6	9	7.5	75
43	Less stakeholder involvement/collaboration/accessibility	7	10	8.5	85
44	Lack of confidence and trust to use eGovernment services	4	7	5.5	55
45	Lack of comprehensive policy	8	9	8.5	85
46	<i>Lack of training</i>	8	10	9	90
47	Lack of performance expectancy	3	5	4	40
48	Lack of effort expectancy	3	6	4.5	45
49	Organisational/cultural dichotomies	8	8	8	80
50	Digital divide	7	9	8	80
51	Poor data systems	2	6	4	40
52	Unclear responsibilities definition	4	8	6	60
53	Lack of social influence	7	7	7	70

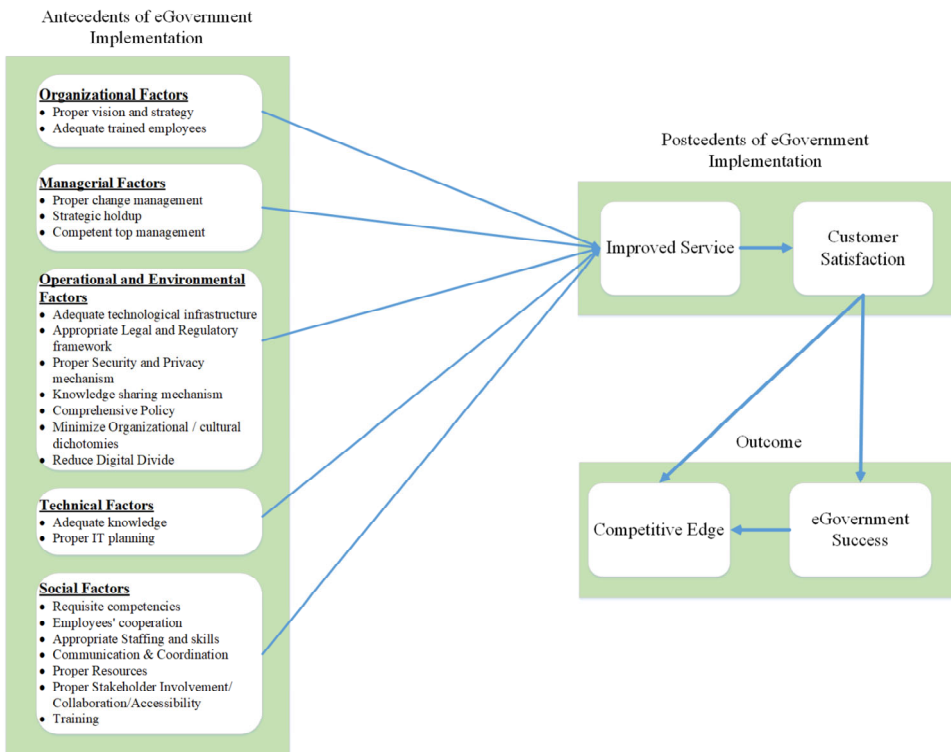
Figure 5 eGov challenges' taxonomies with their respective issues



These most crucial 11 challenges that are considered the most occurring ones in the industry are: lack of adequate knowledge, lack of vision and strategy, poor change management, lack of requisite competencies, inadequate technological infrastructure, incompetency of top management, lack of proper IT planning, staffing and skills issue, security and privacy concerns, lack of resources and lack of training. Table A3 presents the interviewees details.

The challenges identified important in practitioners' view are used to identify the major factors that are significant for the success. Therefore, considering these, a conceptual framework is developed for the success of eGov projects, specifically for the developing world. The conceptual framework is shown in Figure 6. It consists of the antecedents; the important factors, postcedents and the outcome which makes up the eGov initiative a successful one. The antecedents are important to be considered while planning, so that the eGov initiative can be developed with an improved service and provides customer satisfaction. The customer satisfaction is the fulcrum on which the success of any project/organisation depends, and therefore provides the competitive edge over others. The conceptual framework will be beneficial in providing a clear road-map to concerns in order to achieve eGov success.

Figure 6 Conceptual framework for eGov success (see online version for colours)



6.4 Limitations of framework

There are several attributes and factors outlined in the framework. However, some limitations are also intrinsic to the proposed framework. A limitation is that the framework's evaluation depends on the data made available by the practitioners in the industry. Another limitation is that an important component in this framework is the data provided by human, which can vary. In addition, a limitation is the extent to which assessment of the framework can be conducted using the available data.

6.5 Suggested areas for further research

This section describes the possible research areas that need additional investigation in future on the basis of our SLR and empirical investigation. These research gaps suggested below are considered on the basis of the data interpretation in this study:

- 1 *Assigning proper management roles to handle issues:* Very little attention has been given to this important subject. A number of studies have conversed about its importance very strongly. However, more research and investigation is required for this sub-topic.
- 2 *Critical factors' identification:* Few studies have abstractly talked about some specific categories and issues; however, detailed factors that are significant for better progress are still unknown to most of the eGov practitioners. Therefore, we recommend conducting an in-depth study that encompasses list of maximum number of factors and their significance.
- 3 *Participatory studies:* There were few participatory studies in total that reported challenges, i.e., experience report, ethnography and action research. Heeks (2003) highlighted that studies in which researchers are involved is an area that requires further investigation. Therefore, more participatory studies are required in the domain.
- 4 *Real world contexts:* We consider that eGov challenge(s) might be better assessed using real world cases and projects. As the eGov initiatives are developed for improvement, therefore these must be assessed in real-world projects in order to develop a convincing opinion.
- 5 *Integrative studies:* We found that less focus has been given to the integrative studies. Therefore, we suggest that highly integrative research studies must be performed in the eGov domain.
- 6 *Comparative studies:* There were less studies comparing the results. Therefore, we can say that less focus has been given to the comparative studies. As a result, we suggest that more comparative research studies need to be conducted within the field.

7 Conclusions and future work

On the basis of the outcomes of the review part, 53 major eGov challenges were identified, some of which are inadequate knowledge, poor vision/strategy/policies, poor change management, incompetency, inadequate technological infrastructure, contractual

issues, digital divide and unclear responsibilities definition, etc. The second support provided to the domain refers to major categories which encompass these challenges, i.e., taxonomy. Additionally, a major contribution is the identification of real-world eGov challenges that professionals face. Twenty-one challenges are considered to be highly critical, which must be addressed effectively. Accordingly, a conceptual framework has been developed that incorporate the potential antecedents, postcedents and the outcome of the eGov initiative. It can be beneficial to the professionals and the researchers for future work. It provides a clear road-map to the practitioners in order to achieve success.

Our future work will be to identify the best practices in order to address the reported challenges and to investigate the methods adopted by the eGov sector to address challenges currently.

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Appendix

See Tables A1–A3.

Table A1 Results of quality scores of selected studies

<i>Paper title</i>	<i>Paper</i>	<i>QA1</i>	<i>QA2</i>	<i>QA3</i>	<i>QA4</i>	<i>Final score</i>
Designing for a ‘sweet spot’ in an intervention in a least developed country: the case of eGovernment in Bangladesh	P1	0.5	0.5	1	0	2
A comparative analysis of strategies for eGovernment in developing countries	P2	1	0.5	0.5	1	3
Challenges in e-government development: lessons from two information kiosk projects	P3	1	0.5	0.5	0	2
Challenges of e-government project implementation in a South African context	P4	1	0.5	1	0	2.5
Developing fully functional eGovernment: a four stage model	P5	0.5	0.5	1	0	2
Vendors’ challenges in eGovernment projects in Pakistan: experience report of prisons automation	P6	1	1	1	0	3
EGovernment adoption: architecture and barriers	P7	1	1	1	0	3
EGovernment around the world: lessons, challenges, and future directions	P8	0.5	0.5	1	0	2
E-government: challenges and opportunities	P9	0.5	1	1	0	2.5
EGovernment for developing countries: opportunities and challenges	P10	1	1	1	0.5	3.5
EGovernment research: reviewing the literature, limitations and ways forward	P11	0.5	1	0.5	0	2
EGovernment stakeholders: who are they and what do they want?	P12	1	1	1	0.5	3.5
E-government success factors: mapping practical tools to theoretical foundation	P13	1	1	1	0	3
Factors affecting the successful implementation of ICT projects in government	P14	0.5	1	1	0	2.5
Factors influencing the adoption of EGovernment in Pakistan	P15	1	1	1	0	3
Government ICT project failure factors: project stakeholders’ views	P16	0.5	1	1	0.5	3
Information systems and developing countries: failure, success, and local improvisations	P17	1	0.5	1	0	2.5
Information technology in Pakistan: an analysis of problems faced in IT implementation by Pakistan’s banking and manufacturing companies	P18	1	1	1	0	3
Most e-government-for-development projects fail how can risks be reduced?	P19	0.5	0.5	0.5	0	1.5

Table A1 Results of quality scores of selected studies (continued)

<i>Paper title</i>	<i>Paper</i>	<i>QA1</i>	<i>QA2</i>	<i>QA3</i>	<i>QA4</i>	<i>Final score</i>
Organizational challenges to the development of electronic government	P20	0.5	1	0.5	0	2
Research on information systems in developing countries: current landscape and future prospects	P21	0.5	0.5	0.5	0	1.5
The failure of eGovernment in developing countries: a literature review	P22	0.5	0.5	1	0.5	2.5
Project management practices in eGovernment projects: a case study of electronic government directorate (EGD) in Pakistan	P23	1	1	1	0	3
Citizen roles in eGovernment	P24	0.5	0.5	0.5	0	1.5
Understanding service quality and relationship quality in IS outsourcing: client orientation & promotion, project management effectiveness, and the task-technology structure fit	P25	0.5	1	1	0	2.5
eGovernment network: the role of information technology in managing networks	P26	0.5	0.5	0.5	0	1.5
Offshore outsourcing: risks, challenges, and potential solutions	P27	1	1	1	0	3
An empirical evaluation of client-vendor relationships in Indian software outsourcing companies	P28	0.5	0.5	0.5	0	1.5
Client communication practices in managing relationships with offshore vendors of software testing services	P29	0.5	0.5	0.5	0	1.5
Vendor relationship management: the role of shared history and the value of return on trust	P30	0.5	0.5	1	0	2
A general framework for eGovernment: definition maturity challenges, opportunities, and success	P31	1	1	1	0	3
EGovernment, E-participation and challenging issues: a case study	P32	1	1	0.5	0	2.5
Impacts of organizational assimilation of e-government systems on business value creation: a structuration theory approach	P33	0.5	1	0.5	1	3
EGovernment challenges – exploring inter-organizational aspects of e-service development	P34	1	0.5	0.5	0	2
Electronic government outsourcing issues in Malaysia	P35	0.5	1	0.5	0	2
Challenges in e-government and security of information	P36	1	0.5	1	0	2.5
Organizational issues with electronic government procurement: a case study of the UAE	P37	0.5	1	0.5	0	2
Ethical problems for eGovernment: an evaluative framework	P38	0.5	0.5	1	0	2
E-government: five key challenges for management	P39	0.5	0.5	0.5	0	1.5

Table A1 Results of quality scores of selected studies (continued)

<i>Paper title</i>	<i>Paper</i>	<i>QA1</i>	<i>QA2</i>	<i>QA3</i>	<i>QA4</i>	<i>Final score</i>
Towards a framework for eGovernment development in Nigeria	P40	1	1	1	0	3
Public participation and ethical issues on e-governance: a study perspective in Nepal	P41	1	0.5	1	1	3.5
Managing stakeholders' interests in EGovernment implementation: lessons learned from a Singapore eGovernment project	P42	0.5	1	0.5	1	3
E-government strategies in developed and developing countries: an implementation framework and case study	P43	0.5	1	1	0	2.5
E-government in digital era: concept, practice, and development	P44	1	0.5	0.5	0	2
Managing eGovernment projects – a comparative case study of two inter-organizational e-service development initiatives	P45	1	0.5	0.5	1	3
Project management in EGovernment projects: lessons for the Dutch Government	P46	1	1	0.5	1	3.5
Change management as a critical success factor in eGovernment implementation	P47	1	0.5	0.5	0.5	2.5
The successful implementation of eGovernment transformation: a case study in Oman	P48	1	0.5	0.5	0.5	2.5
Rituals in eGovernment implementation: an analysis of failure	P49	0.5	0.5	0.5	0	1.5
EGovernment in the making: socio-economic development in the Akshaya project	P50	1	0.5	0.5	0	2
Enhancement of project management to support and drive transformational eGovernment	P51	1	0.5	1	0	2.5
Auditing projects in eGovernment based on IT governance methods	P52	0.5	0.5	1	0	2
The management of project management: a conceptual framework for project governance	P53	1	1	1	0	3
Where are EGovernments in South Asian countries? A comparative approach	P54	0.5	1	1	0	2.5
Factors affecting eGovernment services adoption: field study	P55	1	0.5	0.5	0	2
Factors influencing electronic government adoption: perspectives of less frequent internet users of Pakistan	P56	0.5	0.5	1	1	3
An exploratory study of proposed factors to adopt eGovernment services Saudi Arabia as a case study	P57	1	1	1	0.5	3.5
Analyzing barriers in eGovernment implementation in Pakistan	P58	0.5	1	1	0	2.5

Table A1 Results of quality scores of selected studies (continued)

<i>Paper title</i>	<i>Paper</i>	<i>QA1</i>	<i>QA2</i>	<i>QA3</i>	<i>QA4</i>	<i>Final score</i>
Innovative framework for eGovernment adoption in Saudi Arabia: a study from the business sector perspective	P59	0.5	0	1	0	1.5
The potential advantages of implementing e-government as well as factors on such adoption	P60	1	1	1	0	3
Adoption of eGovernment in Pakistan: demand perspective	P61	1	1	1	0.5	3.5
Agile innovation management in government: a research agenda	P62	0.5	0.5	0.5	0	1.5
Analyzing eGovernment research: perspectives, philosophies, theories, methods and practice	P63	0.5	0.5	0.5	0	1.5
EGovernment: a global view and an empirical evaluation of some attributes of citizens	P64	1	1	0.5	0	2.5
A structured analysis of eGovernment studies: trends and opportunities	P65	1	1	0.5	1	3.5
Examining internal challenges to eGovernment implementation from system users perspective	P66	1	0.5	1	0	2.5
Exploring issues underlying citizen adoption of eGovernment initiatives in developing countries: the case of Tanzania	P67	1	0.5	0.5	1	3
Implementation of eGovernment: advantages and challenges	P68	0.5	1	1	0	2.5
Sustainable e-governance? Practices, problems and beliefs about the future in Swedish e-Gov practice	P69	1	0.5	1	0.5	3
Understanding the eGovernment paradox: learning from literature and practice on barriers to adoption	P70	1	1	1	0.5	3.5
Modernizing Bangladesh public administration through e-governance: benefits and challenges	P71	1	1	1	0	3
Computerization and eGovernment implementation in Jordan: challenges, obstacles and successes	P72	0.5	1	1	0	2.5
Grounded theory analysis of eGovernment initiatives: exploring perceptions of government authorities	P73	0.5	1	1	0.5	3
Major challenges in developing a successful eGovernment: a review on the Sultanate of Oman	P74	1	0.5	1	0.5	3
Challenges to e-government implementation in developing countries. Nigeria case study	P75	1	0.5	1	0	2.5
E-government in Pakistan: framework of opportunities and challenges	P76	1	0.5	0.5	0	2
Factors affecting the adoption of e-government in Kuwait: a qualitative study	P77	0.5	1	1	0	2.5
E-government implementation challenges in small countries: the project manager's perspective	P78	1	0.5	1	1	3.5

Table A2 List of included studies with references

Paper title	Reference
Designing for a 'sweet spot' in an intervention in a least developed country: the case of e-government in Bangladesh	Gregor, S., Imran, A. and Turner, T. (2010) 'Designing for a 'sweet spot' in an intervention in a least developed country: the case of e-government in Bangladesh', in <i>Proceedings of SIG GlobDev Third Annual Workshop</i> , Saint Louis, USA.
A comparative analysis of strategies for e-government in developing countries	Imran, A. and Gregor, S. (2005) 'A comparative analysis of strategies for e-government in developing countries', <i>Journal of Business Systems, Governance and Ethics</i> , Vol. 2, No. 3, pp.89-99.
Challenges in e-government development: lessons from two information kiosk projects	Anna, Y. and Kei, A. (2005) 'Challenges in e-government development: lessons from two information kiosk projects', <i>Government Information Quarterly</i> , Vol. 22, No. 1, pp.58-74.
Challenges of e-government project implementation in a South African context	Matavire, R., Chigona, W., Roode, D., Sewchurran, E., Davids, Z., Mukudu, A. and Boamah-Abu, C. (2010) 'Challenges of e-government project implementation in a South African context', <i>The Electronic Journal Information Systems Evaluation</i> , Vol. 13, No. 2, pp.153-164.
Developing fully functional EGovernment: a four stage model	Layne, K. and Lee, J. (2001) 'Developing fully functional e-government: a four stage model', <i>Government Information Quarterly</i> , Vol. 18, No. 2, pp.122-136.
Vendors' challenges in e-government projects in Pakistan: experience report of prisons automation	Noor, M., Khan, M., Khan A. and Brekhna (2014) 'Vendors' challenges in e-government projects in Pakistan: experience report of prisons automation', in <i>European Conference on eGovernment</i> , pp.189-197.
E-government adoption: architecture and barriers	Ebrahim, Z. and Irani, Z. (2005) 'E-government adoption: architecture and barriers', <i>Business Process Management Journal</i> , Vol. 11, No. 5, pp.589-611.
E-government around the world: lessons, challenges, and future directions	Paul, T. and Thompson, K. (2003) 'E-government around the world: lessons, challenges, and future directions', <i>Government Information Quarterly</i> , Vol. 20, No. 3, pp.389-394.
E-government: challenges and opportunities	Signore, O., Chessi, F. and Palotti, M. (2005) 'E-government: challenges and opportunities', in <i>Computer Measurement Group (CMG) Italy, XIX Conference</i> , Italy, pp.1-16.
E-government for developing countries: opportunities and challenges	Ndou, V. (2004) 'E-government for developing countries: opportunities and challenges', <i>Electronic Journal on Information Systems in Developing Countries (E/ISDC)</i> , Vol. 18, No. 1, pp.1-24.
E-government research: reviewing the literature, limitations and ways forward	Yildiz, M. (2007) 'E-government research: reviewing the literature, limitations and ways forward', <i>Government Information Quarterly</i> , Vol. 24, No. 3, pp.646-665.
E-government stakeholders: who are they and what do they want?	Rowley, J. (2011) 'E-government stakeholders: who are they and what do they want?', <i>International Journal of Information Management</i> , Vol. 31, No. 1, pp.53-62.
E-government success factors: mapping practical tools to theoretical foundation	Ramon, J. and Pardo, T. (2005) 'E-government success factors: mapping practical tools to theoretical foundation', <i>Government Information Quarterly</i> , Vol. 22, No. 2, pp.187-216.
Factors affecting the successful implementation of ICT projects in government	Gichoya, D. (2005) 'Factors affecting the successful implementation of ICT projects in government', <i>Electronic Journal of e-Government</i> , Vol. 3, No. 4, pp.175-184.
Factors influencing the adoption of e-government in Pakistan	Rehman, M. and Esichaikul, V. (2001) <i>Factors Influencing the Adoption of E-government in Pakistan</i> , IEEE.
Government ICT project failure factors: project stakeholders' views	Nawi, H., Rahman, A. and Ibrahim, O. (2012) 'Government ICT project failure factors: project stakeholders' views', <i>Journal of Research and Innovation in Information Systems</i> , Vol. 2, pp.69-77.
Information systems and developing countries: failure, success, and local improvisations	Heeks, R. (2002) 'Information systems and developing countries: failure, success, and local improvisations', <i>The Information Society Journal</i> , Vol. 18, No. 2, pp.101-112.

Table A2 List of included studies with references (continued)

Paper title	Reference
Information technology in Pakistan: an analysis of problems faced in IT implementation by Pakistan's banking and manufacturing companies	Shaukat, M., Zafarullah, M. and Wajid, R. (2009) 'Information technology in Pakistan: an analysis of problems faced in IT implementation by Pakistan's banking and manufacturing companies', <i>Pakistan Journal of Social Sciences (PJSS)</i> , Vol. 29, No. 1, pp.13–22.
Most e-Government-for-Development Projects Fail How Can Risks be Reduced?	Heeks, R. (2003) <i>Most e-Government-for-Development Projects Fail How Can Risks be Reduced?</i> , Institute for Development Policy and Management
Organizational challenges to the development of electronic government	Aichholzer, G. and Schmutzger, R. (2000) <i>Organizational Challenges to the Development of Electronic Government</i> , pp.379–383, IEEE.
Research on information systems in developing countries: current landscape and future prospects	Walsham, G. and Sahay, S. (2006) 'Research on information systems in developing countries: current landscape and future prospects', <i>Information Technology for Development</i> , Vol. 12, No. 1, pp.7–24.
The failure of e-government in developing countries: a literature review	Dada, D. (2006) 'The failure of e-government in developing countries: a literature review', <i>The Electronic Journal on Information Systems in Developing Countries EJISDC</i> , Vol. 26, No. 7, pp.1–10.
Project management practices in e-government projects: a case study of electronic government directorate (EGD) in Pakistan	Abbas, R., Khalil, S. and Zahid, A. (2011) 'Project management practices in e-government projects: a case study of electronic government directorate (EGD) in Pakistan', <i>International Journal of Business and Social Science</i> , Vol. 2, No. 7, pp.235–243.
Citizen roles in e-government	Goldkuhl, G. (2008) 'Citizen roles in e-government', in <i>Pre-ECIS Workshop on E-government Gateway</i> .
Understanding service quality and relationship quality in IS outsourcing: client orientation & promotion, project management effectiveness and the task-technology-structure fit	Chakarbarthy, S., Whitten, D. and Green, K. (2008) 'Understanding service quality and relationship quality in IS outsourcing: client orientation & promotion, project management effectiveness and the task-technology-structure fit', <i>Journal of Computer Information Systems</i> , Vol. 48, No. 2, pp.1–15.
E-government network: the role of information technology in managing networks	Chen, Y. (2003) 'E-government network: the role of information technology in managing networks', <i>National Public Management Research Conference</i> , Georgetown University, Washington DC.
Offshore outsourcing: risks, challenges, and potential solutions	Herath, T. and Kishore, R. (2010) 'Offshore outsourcing: risks, challenges, and potential solutions', <i>Information Systems Management Journal</i> , Vol. 26, No. 4, pp.312–326.
An Empirical Evaluation of Client-vendor Relationships in Indian Software Outsourcing Companies	Oza, N. (2006) <i>An Empirical Evaluation of Client-vendor Relationships in Indian Software Outsourcing Companies</i> , School of Computer Science, Faculty of Engineering and Information Sciences, University of Hertfordshire, Hertfordshire.
Client communication practices in managing relationships with offshore vendors of software testing services	Robin, P., Simon, J. and Jain, R. (2010) 'Client communication practices in managing relationships with offshore vendors of software testing services', <i>Journal of Communications of the Associations for Information Systems</i> , Vol. 27, No. 1, pp.129–148.
Vendor relationship management: the role of shared history and the value of return on trust	Clemmons, E. (2003) 'Vendor relationship management: the role of shared history and the value of return on trust', <i>Journal of Management Information Systems</i> .
A general framework for e-government: definition maturity challenges, opportunities, and success	Almarabeh, T. and Abuali, A. (2010) 'A general framework for e-government: definition maturity challenges, opportunities, and success', <i>European Journal of Scientific Research</i> , Vol. 39, No. 1, pp.29–42.
E-government, e-participation and challenging issues: a case study	Sharma, G. (2014) 'E-government, e-participation and challenging issues: a case study', <i>International Journal of the Computer, the Internet and Management</i> , Vol. 22, No. 1, pp.23–35.
Impacts of organizational assimilation of e-government systems on business value creation: a structuration theory approach	Hossain, D., Moon, J., Kim, J. and Choe, Y. (2011) 'Impacts of organizational assimilation of e-government systems on business value creation: a structuration theory approach', <i>Journal of Electronic Commerce Research and Applications</i> , Vol. 10, No. 5, pp.576–594.

Table A2 List of included studies with references (continued)

Paper title	Reference
E-government challenges – exploring inter-organizational aspects of e-service development	Anders, P., Karin, A. and Melin, U. (2006) 'E-government challenges – exploring inter-organizational aspects of e-service development', <i>European Conference on Information Systems</i> .
Electronic government outsourcing issues in Malaysia	Samsudin, N., Hashim, R. and Fuzi, S. (2013) 'Electronic government outsourcing issues in Malaysia', <i>Journal of Outsourcing & Organizational Information Management</i> , Vol. 2013, pp.1–10.
Challenges in e-government and security of information	Hwang, M., Li, C., Shen, J. and Chu, Y. (2004) 'Challenges in e-government and security of information', <i>Information and Security an international Journal</i> , Vol. 5, No. 1, pp.9–20.
Organizational issues with electronic government procurement: a case study of UAE	Al-Moalla, A. and Li, D. (2010) 'Organizational issues with electronic government procurement: a case study of UAE', <i>The Electronic Journal on Information Systems in Developing Countries (EJISDC)</i> , Vol. 41, No. 3, pp.1–18.
Ethical problems for e-government: an evaluative framework	Mullen, H. and Horner, D. (2004) 'Ethical problems for e-government: an evaluative framework', <i>Electronic Journal of e-Government</i> , Vol. 2, No. 3, pp.187–196.
E-government: five key challenges for management	Andersen, K. (2006) 'E-government: five key challenges for management', <i>The Electronic Journal of e-Government</i> , Vol. 4, No. 1, pp.1–8.
Towards a framework for e-government development in Nigeria	Mundy, D. and Musa, B. (2010) 'Towards a framework for e-government development in Nigeria', <i>Electronic Journal of e-Government</i> , Vol. 8, No. 2, pp.148–161.
Public participation and ethical issues on e-governance: a study perspective in Nepal	Sharma, G., Bao, X. and Peng, L. (2014) 'Public participation and ethical issues on e-governance: a study perspective in Nepal', <i>Electronic Journal of e-Government</i> , Vol. 12, No. 1, pp.82–96.
Managing stakeholders' interests in e-government implementation: lessons learned from a Singapore e-government project	Tan, C., Pan, S. and Lim, E. (2005) 'Managing stakeholders' interests in e-government implementation: lessons learned from a Singapore e-government project', <i>Journal of Global Information Management</i> , Vol. 13, No. 1, pp.31–53.
E-government strategies in developed and developing countries: an implementation framework and case study	Chen, Y., Chen, H., Huang, W. and Ching, R. (2006) 'E-government strategies in developed and developing countries: an implementation framework and case study', <i>Journal of Global Information Management</i> , Vol. 14, No. 1, pp.23–46.
E-government in digital era: concept, practice, and development	Fang, Z. (2002) 'E-government in digital era: concept, practice, and development', <i>International Journal of the Computer, the Internet and Management</i> , Vol. 10, No. 2, pp.1–22.
Managing e-government projects – a comparative case study of two inter-organizational e-service development initiatives	Ulf, M. and Karin, A. (2006) 'Managing e-government projects – a comparative case study of two inter-organizational e-service development initiatives', <i>European Conference on Information Systems</i> .
Project Management in E-Government Projects: Lessons for the Dutch Government	Veem, R. (2015) <i>Project Management in E-Government Projects: Lessons for the Dutch Government</i> , Cordaid Society.
Change management as a critical success factor in e-government implementation	Nograsek, J. (2011) 'Change management as a critical success factor in e-government implementation', <i>Journal of Business Systems Research</i> , Vol. 2, No. 2, pp.1–56.
The successful implementation of e-government transformation: a case study in Oman	Al-Azri, A., Al-Salti, Z. and Al-Karaghoul, W. (2010) 'The successful implementation of e-government transformation: a case study in Oman', in <i>European, Mediterranean & Middle Eastern Conference on Information Systems 2010 (EMCIS2010)</i> , Abu Dhabi, UAE, pp.1–11.
Rituals in e-government implementation: an analysis of failure	Rahul, D. and Sarkar, S. (2010) 'Rituals in e-government implementation: an analysis of failure', <i>International Conference on Electronic Government</i> .

Table A2 List of included studies with references (continued)

Paper title	Reference
E-government in the making: socio-economic development in the Akshaya project	Cordella, A. and Hesse, J. (2010) 'E-government in the making: socio-economic development in the Akshaya project', in <i>18th European Conference on Information Systems</i> , Pretoria, pp.1–12.
Enhancement of project management to support and drive transformational eGovernment	Furlong, S. (2014) 'Enhancement of project management to support and drive transformational eGovernment', <i>Journal of Inspiration Economy</i> , Vol. 1, No. 1, pp.41–64.
Auditing Projects in e-Government based on IT Governance Methods	Kühn, A., Walsler, K. and Riedl, R. (2009) <i>Auditing Projects in e-Government based on IT Governance Methods</i> , Society for Competence Centre Public Management.
The management of project management: a conceptual framework for project governance	Too, E. and Weaver, P. (2014) 'The management of project management: a conceptual framework for project governance', <i>International Journal of Project Management</i> , Vol. 32, No. 8, pp.1382–1394.
Where are e-governments in South Asian countries? A comparative approach	Seo, J. and Mehdi, H. (2015) 'Where are e-governments in South Asian countries? A comparative approach', <i>A Research Journal of South Asian Studies</i> , Vol. 30, No. 2, pp.7–24.
Factors affecting e-government services adoption: field study	Alraja, M., Hammami, S. and Alhousary, T. (2015) 'Factors affecting e-government services adoption: field study', <i>Journal of Theoretical and Applied Information Technology</i> , Vol. 78, No. 1, pp.65–69.
Factors influencing electronic government adoption: perspectives of less frequent internet users of Pakistan	Alam, F. and Ahmad, B. (2015) 'Factors influencing electronic government adoption: perspectives of less frequent internet users of Pakistan', <i>International Journal of Scientific & Technology Research</i> , Vol. 4, No. 1, pp.306–315.
An exploratory study of proposed factors to adopt e-government services Saudi Arabia as a case study	Sulaiman, A., Richard, M. and Wills, B. (2013) 'An exploratory study of proposed factors to adopt e-government services Saudi Arabia as a case study', <i>International Journal of Advanced Computer Science and Applications</i> , Vol. 4, No. 11, pp:57–66.
Analyzing barriers in e-government implementation in Pakistan	Kayani, B., Ehsan, M., Perwez, R. and Humayun, H. (2011) 'Analyzing barriers in e-government implementation in Pakistan', <i>International Journal for Information (IJ)</i> , Vol. 4, Nos. 3/4, pp.494–500.
Innovative framework for e-government adoption in Saudi Arabia: a study from the business sector perspective	Alghamdi, S. and Beloff, N. (2016) 'Innovative framework for e-government adoption in Saudi Arabia: a study from the business sector perspective', <i>International Journal of Advanced Computer Science and Applications (IJACSA)</i> , Vol. 7, No. 1, pp.655–664.
The potential advantages of implementing e-government as well as factors on such adoption	Rahimy, S. (2016) 'The potential advantages of implementing e-government as well as factors on such adoption', <i>International Business Management Journal</i> , Vol. 10, No. 3, pp.292–300.
Adoption of e-government in Pakistan: demand perspective	Haider, Z., Shuwen, C. and Abbasi, Z. (2015) 'Adoption of e-government in Pakistan: demand perspective', <i>International Journal of Advanced Computer Science and Applications (IJACSA)</i> , Vol. 6, No. 5, pp.71–80.
Agile innovation management in government: a research agenda	Mergel, I. (2016) 'Agile innovation management in government: a research agenda', <i>Government Information Quarterly</i> , Vol. 33, No. 3, pp.516–523.
Analyzing e-government research: perspectives, philosophies, theories, methods and practice	Heeks, R. and Bailur, S. (2007) 'Analyzing e-government research: perspectives, philosophies, theories, methods and practice', <i>Government Information Quarterly</i> , Vol. 24, No. 2, pp.243–265.
E-government: a global view and an empirical evaluation of some attributes of citizens	Akman, I., Yazici, A., Mishra, A. and Arifoglu, A. (2005) 'E-government: a global view and an empirical evaluation of some attributes of citizens', <i>Government Information Quarterly</i> , Vol. 22, No. 2, pp.239–257.
A structured analysis of e-government studies: trends and opportunities	Joseph, R. (2013) 'A structured analysis of e-government studies: trends and opportunities', <i>Government Information Quarterly</i> , Vol. 30, No. 4, pp.435–440.

Table A2 List of included studies with references (continued)

Paper title	Reference
Examining internal challenges to e-government implementation from system users perspective	Al-Rashidi, H. (2010) 'Examining internal challenges to e-government implementation from system users perspective', in <i>European and Mediterranean Conference on Information Systems (EMCIS2010)</i> , Abu Dhabi, UAE.
Exploring issues underlying citizen adoption of eGovernment initiatives in developing countries: the case of Tanzania	Yonazi, J., Sol, H. and Boonstra, A. (2010) 'Exploring issues underlying citizen adoption of eGovernment initiatives in developing countries: the case of Tanzania', <i>Electronic Journal of e-Government</i> , Vol. 8, No. 2, pp.176–188.
Implementation of e-government: advantages and challenges	Alshehri, M. and Drew, S. (2010b) 'Implementation of e-government: advantages and challenges', in <i>IASK International Conference E-Activity and Leading Technologies & InterTIC</i> , pp.79–86.
Sustainable eGovernment? Practices, problems and beliefs about the future in Swedish eGov practice	Larsson, H. and Grönlund, A. (2016) Sustainable eGovernment? Practices, problems and beliefs about the future in Swedish eGov practice', <i>Government Information Quarterly</i> , Vol. 33, No. 1, pp.105–114.
Understanding the e-government paradox: learning from literature and practice on barriers to adoption	Savoldelli, A., Codagnone, C. and Misuraca, G. (2014) 'Understanding the e-government paradox: learning from literature and practice on barriers to adoption', <i>Government Information Quarterly</i> , Vol. 31, pp.S63–S71.
Modernizing Bangladesh public administration through e-government: benefits and challenges	Bhuiyan, S. (2011) 'Modernizing Bangladesh public administration through e-government: benefits and challenges', <i>Government Information Quarterly</i> , Vol. 28, No. 1, pp.54–65.
Computerization and e-government implementation in Jordan: challenges, obstacles and successes	Al-Nagi, E. and Hamdan, M. (2009) 'Computerization and e-government implementation in Jordan: challenges, obstacles and successes', <i>Government Information Quarterly</i> , Vol. 26, No. 4, pp.577–583.
Grounded theory analysis of e-government initiatives: exploring perceptions of government authorities	Lee, J. and Kim, J. (2007) 'Grounded theory analysis of e-government initiatives: exploring perceptions of government authorities', <i>Government Information Quarterly</i> , Vol. 24, No. 1, pp.135–147.
Major challenges in developing a successful e-government: a review on the Sultanate of Oman	Sarrayrih, A. and Sriram, B. (2015) 'Major challenges in developing a successful e-government: a review on the Sultanate of Oman', <i>Journal of King Saud University – Computer and Information Sciences</i> , Vol. 27, No. 2, pp.230–235.
Challenges to e-government implementation in developing countries. Nigeria case study	Aneke, S., Bakht, H. and Desta, A. (2019) 'Challenges to e-government implementation in developing countries. Nigeria case study', <i>Journal of Computing and Management Studies</i> , Vol. 2, No. 3, pp.1–16, ISSN: 2516-2047.
E-government in Pakistan: framework of opportunities and challenges	Chandio, A.R., Haider, Z., Ahmed, S., Ali, M. and Ameen, I. (2018) 'E-government in Pakistan: framework of opportunities and challenges', <i>Global Scientific Journal</i> , Vol. 6, No. 12, pp.490–501, ISSN: 2320-9186.
Factors affecting the adoption of e-government in Kuwait: a qualitative study	Elenezi, H., Tarhini, A., Masadeh, R., Alalwan, A. and Al-Oirim, N. (2017) 'Factors affecting the adoption of e-government in Kuwait: a qualitative study', <i>The Electronic Journal of e-Government</i> , Vol. 15, No. 2, pp.84–102.
E-government implementation challenges in small countries: the project manager's perspective	Glyptis, L., Christofi, M., Vrontis, D., Giudice, M., Dimitriou, S. and Michael, P. (2020) 'E-government implementation challenges in small countries: the project manager's perspective', <i>Technological Forecasting & Social Change</i> , Vol. 152, p.119880.

Table 3 Details of interviewees

<i>Sr. no.</i>	<i>Job title</i>	<i>Experience (years)</i>	<i>Scope of organisation</i>	<i>Size</i>
1	Project manager	5	Vendor	Large
2	Project manager	7	Client	Large
3	Associate vice president	21	Client	Large
4	Project director	11	Client	Large
5	Senior team lead	4	Vendor	Large
6	Senior project manager	6	Client	Large
7	Program manager	7	Client	Large
8	Corresponder	9	Client	Large
9	Department vice resident	10	Client	Large
10	IT consultant	8	Vendor	Large
11	Project director	14	Client	Large
12	Client relationship manager	9	Vendor	Large
13	Senior developer	8	Vendor	Large
14	Project manager	13	Client	Large
15	Business analyst	10	Vendor	Large
16	Project consultant	7	Vendor	Large
17	Project coordinator	6	Client	Large
18	Project manager	10	Vendor	Large
19	Senior team lead	4	Vendor	Medium
20	Developer	2	Vendor	Large