Strategy, Policy, and Legal Barriers to E-Gov Implementation in Afghanistan

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ABSTRACT This research aims to identify the strategy, policy, and legal obstacles facing the implementation of E-Gov in Afghanistan from the perspective of the government employee. Accordingly, an empirical study was conducted using statistical and descriptive analysis research methods to determine the existing strategy, policy, and legal barriers. The literature review on the subject showed that while there have been several papers focusing on obstacles to E-Gov in developing countries, including Afghanistan, few studies have focused specifically on strategy, policy, and the legal barriers to E-Gov within the public sector of Afghanistan. This study takes as its sample a total of 387 employees from 10 different government institutions in Afghanistan. The final results of the analysis indicate that respondents agreed on the existence of all the strategy, policy, and legal barriers listed in the survey. However, of interest was that four obstacles out of 11 rated either agreed or strongly agreed by respondents; that is, the absence of implementation guidance for E-Gov Projects (57.82%); lack of legal bases and comprehensive policy (58.35%); lack of security rules, policies and privacy law (58.39%); and lack of political commitment and coordination (58.34%), all of which were considered significant barriers. Therefore, the findings of this paper contribute towards filling the knowledge gap of E-Gov sector strategy, policy, and legal barriers. Furthermore, the results of the survey confirm the hypothesis that strategy, policy and legal barriers are among the major challenges facing effective implementation of E-Gov initiatives.

INDEX TERMS Afghanistan, barriers, E-Gov, legal, strategy, policy.

I. INTRODUCTION

The history of computing in government institutions can be traced back to the beginning of computer history; however, the term E-Gov (also called Electronic Government, Digital Government, Electronic Governance) emerged in the late 1990s. The term E-Government, identical to the term E-Commerce, was born out of the internet boom. Furthermore, since the 1990s, the E-Gov field grew considerably in size, both in its contents and position. E-Gov is a growing field, interesting both as a novel research field for information system theories and methods and as a source for information system practitioners’ contributions [3]. E-Gov refers to the systems of information communication technologies (ICTs) [1] used by governments to deliver public services and make efficient the processes involved in conducting business, with the aim of renovating the relationship between Government and Business (G2B), Government and Citizen (G2C), Government and employee (G2E) as well as different sectors within the government (G2G).

E-Gov adoption rate is increasing rapidly in developing countries, servicing the promotion of good governance and accountability within the public sector [14]. Moreover, evidence shows that E-Gov can facilitate the delivery mechanisms needed by citizens and stakeholders in a streamlined, efficient and cost-effective manner, making it an ideal solution for developing countries, such as Afghanistan [15].

While developed countries compete to offer advanced E-Gov services, many developing countries find themselves unable to gain the fundamental advantages of E-Gov. A number of barriers at the level of government prevent the realization of benefits offered by E-Gov and hinder the
successful implementation and adoption of E-Gov initiatives [6]. According to [4], [6], [15], [19]–[21]; barriers to effective E-Gov implementation have been categorized into the following categorical dimensions: technology and IT infrastructure, strategy, policy and law, organizational modes and culture, and operational cost barriers. The categories listed above are characterized by a series of individual obstacles that exist in time and place; namely, the early to final stages of E-Gov system implementation, and the continuum of developing to developed country. Consequently, the existence of such barriers is considered a prominent factor contributing to E-Gov system implementation project failure. Thus, this research aims to identify the strategy, policy, and legal obstacles facing the implementation of E-Gov in Afghanistan from the government employee perspective.

This paper is structured as follows: section 2 conducts a literature review of articles that have previously inquired into the failure of the implementation of E-Gov in Afghanistan and comparable countries and the articulation of barriers thereof. Section 3 describes the methodology used in this paper to study the likely reasons for the failure of E-Gov implementation in the context of Afghanistan. In section 4 the results of the study are provided and discussed. Finally, in section 5, conclusions are drawn, implications are teased out, and recommendation are made.

II. LITERATURE REVIEW
E-Gov system implementation has the capacity to improve the delivery of government services to stakeholders, especially in developing countries. However, barriers against E-Gov system implementations can result in project failure. The rate of project failure or failure to accomplish the expected outcome of E-Gov initiatives has been estimated more than 60 per cent. Due to the many governmental barriers, the failure rate of E-Gov system implementation is comparatively higher in developing countries [4]. E-Gov project failure has been attributed to limited funding, lack of adequate ICT infrastructure, and inadequate policy frameworks. Furthermore, the absence of crafted policies is another barrier obstructing E-Gov adoption in developing countries [15].

To better understand and get a comprehensive idea of the barriers to the successful implementation of E-Gov, recent related works are briefly organized as follows:

Al-Rawahna et al. [6] identify in an empirical study the E-Gov barriers to successful E-Gov implementation in the context of the Jordanian government. Their paper conducted a survey among 153 IT managers and IT professionals within the public sector agencies of Jordan. E-Gov barriers were classified into five categories: strategy, technological and IT infrastructure, policy and law, organization and culture, and operational cost, as per an extensive literature review of related studies. It was concluded from the findings that a lack of IT infrastructure readiness was the most substantial factor negatively impacting E-Gov performance and a prominent factor contributing to user dissatisfaction [6].

Giri et al. [21] explore the challenges of E-Gov implementation in Nepal, specifically in relation to the effective service delivery within the civil service. The study derived its primary data from a set of questionnaires directed at public sector government organizations and those government officials whose primary task was the provision of services to citizens. The survey was framed according to the following categories: the assessment of infrastructure development, human resource development and management, trust in E-Gov systems, the digital divide and information security, and data protection. Analysis of the data collected concluded that human resource development and management, digital divide and information security, infrastructural development, and data protection were considered the significant challenges of effective service delivery in the civil service of Nepal [21].

Samsor [19] identifies and discusses the challenges and prospects of E-Gov implementation in Afghanistan. The author aims to identify the obstacles and barriers to E-Gov in developing countries that are also experiencing conflict and the social constraints typical in such countries, particularly Afghanistan. This paper consists of both theoretical and empirical studies, using both qualitative and qualitative methods for data collection. Based on the literature review, the author identified 15 barriers divided into three major categories: 1) organizational barriers—leadership, resistance to change, information sharing, collaboration, stakeholder involvement, and legal impacts; 2) social obstacles—culture, digital divide, and ICT literacy; 3) ICT obstacles—infrastructure, finance, security, privacy, and policy. The final findings of the paper established that five barriers out of the 15 named by respondents are considered to be the major obstacles; namely, stakeholder involvement, coordination information sharing, ICT literacy, and e-Gov awareness [19].

Shrestha et al. [20] identify and discuss factors that impinge negatively on E-Gov practices in Nepal. Research methodology was based on surveys made up of semi-structured questionnaires and interviews with government officials from the different ministries of Nepal. Based on the literature review, Shrestha et al. initially hypothesized that barriers to E-Gov implementation in Nepal consisted of the following: inadequate IT infrastructure, lack of awareness for E-Gov services, lack of security and privacy, lack of confidence, insufficient skilled human resources, lack of public-private collaborations and partnerships, lack of training and knowledge transfer, lack of E-Gov transformation (i.e., resistant to change), budgets and operating costs, lack of clear strategic vision, as well as policy vacuum and an inadequate legal framework. The findings of this study verified the hypothesis and established clearly that all 11 items mentioned above were constituted barriers to successful E-Gov implementation in Nepal. However, the respondents felt that policy vacuum (63.25%), training and knowledge transfer (65%) and E-Gov transformation (65%) were the most critical barriers posing a significant challenge to successful implementation of E-governance [20].
A. E-GOV BARRIERS

In the literature, E-Gov barriers are described as “Characteristics—either real or perceived—of legal, social, technological or institutional contexts which work against developing networked governments because they: impede demand, by acting as a disincentive or obstacle for users to engage with e-government services; or impede supply, by acting as a disincentive or obstacle for public sector organizations to provide e-government services; or constrain efforts to reconfigure access to information, people and public services in ways enabled by ICTs” [5]. According to [4], [6], [15], [19]–[21] barriers to E-Gov have mainly been categorized into the following categorical fields: 1) organization and culture; 2) operational cost barriers; 3) technological and IT infrastructure; 4) strategy, policy and law. Such barriers incorporate series of individual obstacles that pertain to a specific time period, starting from the initial stages of E-Gov system implementation to the final stages and are deemed to vary according to a country’s socio-economic status along a continuum from developing to developed.

1) ORGANIZATIONAL AND CULTURAL BARRIERS

The implementation of E-Gov initiatives is not solely a technical issue but, in addition, an organizational issue. Moreover, the main barrier to the adoption of E-Gov systems is also related to the cultural implications of technology for a society, which means that when those changes impinge on societal norms, they are more likely to face resistance [19], [22]. Organizational and cultural barriers include resistance to change, lack of relevant in-house management and IT skills, lack of effective leadership and support, the complexity of re-engineering government processes and procedures, lack of agency readiness, lack of knowledge of security risks, slow pace of government reforms, lack of cooperation and coordination between government agencies, and pervasive corruption in government entities [6].

2) OPERATIONAL COST BARRIERS

Insufficient financial support is considered a significant obstacle to the implementation of E-Gov in many countries. It is a given that the successful implementation of the E-Gov initiative requires the availability of sufficient budgetary resources [22]. The high cost of the installation, operation, and maintenance of E-Gov systems, the on-going cost of the training of personnel, the employment of IT professionals and consultants, coupled with shortages of financial resources in the public sector are considered significant operational cost barriers to E-Gov system implementation [6].

3) TECHNOLOGY AND IT INFRASTRUCTURE BARRIERS

Lack of information communication technology infrastructure is considered one of the main challenges for E-Gov implementation [9], [20], [22]. Based on the literature review, technological and IT infrastructure barriers have been defined in the following terms: privacy and security issues, the inflexibility of legacy systems, lack of architecture interoperability and systems integration, different security models, incompatible technical standards, shortage of reliable networks and low bandwidth, inadequate security of government hardware and software, unauthorized external and internal access to information systems, and lack of open-source software and standards [6], [20].

4) STRATEGY, POLICY, AND LEGAL BARRIERS

The absence of implementation guidance, funding issues, over-ambitious E-Gov milestones, unclear vision and management strategy, shared E-Gov goals and objectives, and lack of ownership and governance are recognized as significant strategy barriers against effective E-Gov system implementation [6]. Lack of regulation for e-usage, ICT policy, and law is considered among the challenges to E-Gov systems in developing countries [4], [6], [15]. Based on the literature reviews, the digital divide, lack of legal bases and comprehensive policy, data ownership conflicts, lack of security rules, policies, privacy law, and lack of political commitment and coordination are considered primary policy and legal barriers to E-Gov [6], [19]. The above strategy, policy and legal barriers are briefly elaborated in the discussion of this paper’s findings in Section 4.

B. E-GOV IN AFGHANISTAN

In 1930, the establishment of a small exchange medium in Kabul began the arrival of modern communications in Afghanistan. Gradually, the network expanded through copper wire to five additional urban areas. However, this infrastructure was destroyed as a result of political and military conflict beginning in the mid 1970s and under-investment during the same period. In the early days of the transitional government in 2002, the ICT infrastructure was still insignificant, and services were minimal. That same year, in October 2002, Afghanistan adopted and posted the first modern policy for the ICT sector to one of the first government websites. Subsequently, in July 2003, this policy document was further revised by dividing it into two separate policies—one for ICT applications and a vision of the information society, and a second for regulatory principles and basic telecom infrastructure. These policy documents constituted a cornerstone and were given a legal basis in the form of the Telecom Law published in Official Gazette 787. In June 2006, Afghanistan’s Telecommunication Regulatory Authority (ATRA) was established to implement key components of a telecom infrastructure, while the ICT application components were implemented by the ICT Council, established in May 2007 [16]. In 2008, the Ministry of Communication and Information Technology (MoCIT), as a step towards E-Gov system implementation in Afghanistan and filling the void of a comprehensive E-Gov strategy, started developing such a strategy following a program that was developed by the United Nations University International Institute for Software Technology, publishing it in 2011 [17]. Finally, to fulfil the far-reaching potential of the digital transformation of
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Afghanistan, the National Statistics and Information Authority (NSIA) introduced the Digital Foundation Strategy for Afghanistan (DFS4A). DFS4A was built on four core strategic pillars that would command the government’s attention for three years, from 2019 to 2021, to address issues around the building of digital foundations [18].

1) BARRIERS TO E-GOV IN AFGHANISTAN
It is evident from the literature review that there is a dearth of published research on barriers to E-Gov implementation in Afghanistan, specifically on barriers related to the strategy, policy and legal frameworks. However, one recently published paper has categorized and described barriers to E-Gov in Afghanistan. This theoretical and empirical study aimed to identify the obstacles of E-Gov in Afghanistan and has identified 15 barrier types that may be construed in three major categories: 1) organizational barriers—leadership, resistance to change, information sharing, collaboration, stakeholder involvement, and legal impacts; 2) social obstacles—culture, digital divide, and ICT literacy; 3) ICT obstacles—infrastructure, finance, security, privacy, and policy. Based on an empirical study and in-depth interviews with government and private sector experts in Afghanistan, issues such as coordination, stakeholder involvement, information sharing, ICT literacy, and E-Gov awareness were considered the five significant obstacles out of the 15 named by the respondents as barriers to E-Gov implementation in Afghanistan [19].

III. METHODOLOGY
As is evident from the literature review of recent related works, in the majority of similar papers, the survey is the main method to identify and describe barriers to E-Gov implementation. To this end, a survey questionnaire was set up for this project, grounded on a comprehensive literature review and the study of definitions. A final set of 32 items was designed for the questionnaire and organized according to the five major types of barrier. In the interest of comprehension, the questionnaire was presented in both English and Dari, with a pilot study being deployed among 35 respondents to validate the survey items. In line with the answers of respondents to which they were intended. Furthermore, Correlation Analysis (Pearson) has been deployed as well, where we check If Sig. < 0.05 = valid, If Sig. > 0.05 = not valid and delete the survey items. In line with the answers of respondents to the pilot study, all survey items were validated and were thus retained for the final study. The resulting final questionnaire was separated into six sections: questions of demographics, barriers to strategy, policy and legal barriers, technological and IT infrastructure barriers, organizational and cultural barriers, and operational cost barriers of E-Gov implementation in Afghanistan. This paper, however, deals explicitly with the 11 survey items related to the policy, legal, and strategy barriers to E-Gov system implementation in Afghanistan. The survey instrument was developed using items adopted from previous studies mainly from “IS success model”. Participants were asked to indicate how frequently each statement fits them using 5-Point Likert Scale, wherein 1 indicates Strongly Disagree, with 5 indicating Strongly Agree. The first section contains five demographic and profile characteristics that include questions regarding the gender of the participant, age, educational level, affiliate organization (all were public sector government institutions), and position therein.

The second section was related to barriers impeding strategy (6 items). The third section is made up of items designed to measure technological and IT infrastructure barriers (9 items). In the fourth section, the items related to policy and legal barriers (5 items). The fifth section of the questionnaire was related to operational and cultural barriers (9 items). The sixth and final section was related to operational cost barriers (3 items). Since the research aimed to test the hypothesis that strategy, policy and legal barriers are among the major challenges facing effective implementation of E-Gov initiatives, a quantitative approach was conducted in the form of paper questionnaires. In order to present the analysis and findings of this project with clarity and immediacy, the demographic breakdown of participants and descriptive and inferential statistical analysis have been analyzed and visualized using R programming language’s ggplot2 and Likert libraries. Furthermore, the inferential analysis Spearman Rank correlation used R programming language to analyze and visualize the correlation between the variables of interest.

IV. DATA ANALYSIS, RESULTS AND DISCUSSIONS
The main goal of the research is to address 11 items of the survey questionnaire and identify the strategy, policy, and legal obstacles facing E-Gov in Afghanistan from the government employee perspective. Hence, 387 government employees were chosen as participants randomly from the Office of the Chief Executive, Ministry of Justice, Ministry of Economy, Ministry of Agriculture, Ministry of Defense, Ministry of Energy and Water, Ministry of Foreign Affairs, Ministry of Finance, Supreme Audit Office, and Academy of Science government institutions. Government employees who responded to the questionnaire held Senior to Junior positions. Out of the total targeted government employees, 61.24 % were male, 36.17% female and 2.58 % did not mention their gender. (see Table 1 and Figure 3).

Furthermore, most questionnaire respondents were from the Ministry of Finance and its Revenue Department, which has become an independent government institution now, at a total of 19.1%. Other figures for the rate of response were, the Ministry of Energy and Water, and Office of the Chief Executive—10.33% each; the Ministry of Agriculture—9.81%; the Academy of Science of Afghanistan—9.56%; the Ministry of Foreign Affairs—9.3%; the Supreme Audit Office—9.04%; the Ministry of Economy—8.78%; the Ministry of Justice—8.52%; and finally, the Ministry of Defense—5.16%, all of which are shown in Table 1 and
TABLE 1. Demographic breakdown of participants.

| Category                              | Frequency | Percent |
|---------------------------------------|-----------|---------|
| Gender                                |           |         |
| Male                                  | 237       | 61.24   |
| Female                                | 140       | 36.17   |
| Unknown                               | 10        | 2.58    |
| Total                                 | 387       | 100     |
| Age                                   |           |         |
| 21-30                                 | 172       | 44.4    |
| 31-40                                 | 112       | 28.94   |
| Above 41                              | 76        | 19.63   |
| Unknown                               | 27        | 6.97    |
| Total                                 | 387       | 100     |
| Education                             |           |         |
| Diploma                               | 22        | 6.97    |
| Bachelor’s                            | 234       | 60.46   |
| Master’s                              | 86        | 22.22   |
| Ph.D.                                 | 13        | 3.35    |
| Unknown                               | 32        | 8.26    |
| Total                                 | 387       | 100     |
| Government Institution                |           |         |
| Ministry of Justice                   | 33        | 8.52    |
| Ministry of Energy and Water          | 40        | 10.33   |
| Ministry of Foreign Affairs           | 36        | 9.3     |
| Ministry of Economy                   | 34        | 8.78    |
| Ministry of Agriculture               | 38        | 9.81    |
| Ministry of Defense                   | 20        | 5.16    |
| Other Departments                     | 37        | 9.56    |
| Revenue Department (ARD)              | 28        | 7.23    |
| ARD - Standard Integrated Government Tax Administration System | 9 | 2.32 |
| Office of the Chief Executive         | 40        | 10.33   |
| Academy of Science of Afghanistan     | 37        | 9.56    |
| Supreme Audit Office                  | 35        | 9.04    |
| Total                                 | 387       | 100     |

Figure 4. The respondents’ educational level consists of Diploma, Bachelor’s degree, Master’s degree, and Ph.D. Of these academic levels, Diploma holder respondents comprised 6.97%; Bachelor’s 60.46%; Master’s 22.2%; Ph.D. 3.35%; while 8.26% of respondents did not mention their academic level (see Table 1 and Figure 1). The respondents’ age distribution was categorized between 21-30, 31-40, and above 41 years. The majority of the questionnaire respondents’ age was between 21-30 years, at 44.4%, followed by 31-40 years at 28.9%, and above 41 years at 19.63%, while 6.97% did not select any of the listed categorized age intervals. (see Table 1 and Figure 2).

A. ANALYSIS OF THE VARIABLES OF INTEREST

The previous section covered the respondents’ demographic, which consisted of age, gender, education, government institutions. This section will focus on the strategy, policy, and legal barriers, addressing 11 items of the questionnaire. Responses to these survey items were visualized using the R programming language’s Likert library. Furthermore, to avoid underestimation of individual scores, the missing values have been handled through item mean substitution (IMS). IMS is an effective representation of the original data if the missing values are equal to or less than 20%, which makes it the ideal imputation technique for our dataset [12].

St1: Government institutions need guidance on transforming the central government’s established vision of E-Gov into more concrete specifications for E-Gov services. Hence, multiple governments have established organizational governmental structures to handle the process of strategizing and implementing E-Gov initiatives. [8] Subsequently, most of the survey participants leaned towards the Agree side of the Likert when expressing their opinion on the absence of implementation guidance of E-Gov projects in Afghanistan. Hence, the responses obtained align with this paper’s literature review, which shows the absence of implementation guidance as a significant barrier to the E-Gov implementation of projects in other countries. Out of 387 participants in our survey, 100 were neutral in their opinion, 107 expressed their strong agreement, and 111 agreed, with only 6 stating their strong disagreement and 63 disagreeing on the subject. There is a stark difference in the number of participants on the polar opposite side of the Likert. This difference illustrates the fact that there is a significant agreement on the absence of implementation guidance provided to E-Gov projects in Afghanistan. (see Table 2, Figure 5, and 6).

St2: In order to maximize the potential offered by an E-Gov initiative, it is essential to bring changes in the
management strategy, organizational culture, and individual attitudes within the institution to establish a solid and clear vision and management strategy. [9] As shown in Table 2 and Figure 6, most survey respondents agreed on the presence of unclear vision and management strategy of E-Gov project implementation in Afghanistan while expressing their opinions. From the 387 survey participants, 130 were neutral in their view, 56 expressed their strong agreement, and 150 agreed, with only 12 stating their strong disagreement and 39 disagreeing on the subject. This difference on the polar opposite side of the Likert illustrates that there is a significant agreement on the absence of implementation guidance provided to E-Gov projects in Afghanistan.

**St3:** The over-ambitious nature of the E-Gov milestones were identified as the main barrier against E-Gov system integration and implementation. The underestimation of E-Gov project implementation efforts will make the government milestones appear even more ambitious. Low estimation is also considered the common reason for overruns on information technology projects in general [8]. As shown in Table 2 and Figure 7, the majority of the survey respondents have either agreed or strongly agreed on the determining over-ambitious E-Gov milestones for the development and implementation of public sector systems in Afghanistan. From the 387 survey participants, 115 were neutral in their opinion, 64 expressed their strong agreement, and 137 agreed, with only 12 stating their strong disagreement and 59 disagreeing on the subject.
on the subject. There is a noticeable difference in the number of participants on the polar opposite side of the Likert. Therefore, per the paper’s literature review, the obtained responses show E-Gov projects’ unclear vision and management strategy as a barrier to E-Gov project implementation.

St4: Lack of shared goals and objectives among different government institutions was identified as a significant barrier to E-Gov system implementation processes. Not having shared goals and objectives creates a lack of clarity, conflict, or confusion in defining responsibilities and roles and ownership in the joint planning of E-Gov initiatives among government agencies [8]. As shown in Table 2 and Figure 8, most of the survey respondents expressed their agreement and strong agreement on the lack of ownership and governance of E-Gov systems in Afghanistan. Thus, based on the conducted survey of 387 survey participants, 126 were neutral in their opinion, 77 expressed their strong agreement, 127 agreed, 44 disagreed, and only 9 stated their strong disagreement on the survey item. There is an evident difference in the number of participants on both sides of the Likert scale, which determines the E-Gov Project’s lack of ownership and governance as a barrier in Afghanistan.

St5: The absence of formal project accountability or the dilution of responsibility resulting from many project stakeholders’ involvement is considered the main reason for the lack of ownership and governance in E-Gov system implementation [8]. As shown in Table 2 and Figure 9, most of the survey respondents agreed and strongly agreed on the absence of implementation guidance of E-Gov projects as a strategy barrier to E-Gov in Afghanistan. From the 387 survey participants, 122 were neutral in their opinion, 75 expressed their strong agreement, 135 agreed, 46 disagreed, with only 9 stating their strong disagreement on the survey item. Subsequently, there is an obvious difference in the number of participants on the polar opposite side of the Likert.

St6: The financial availability of most E-Government projects in developing countries is dependent on monetary aid from international organizations such as the United Nations, OECD, and other agencies of developed countries. This type of provision is unsustainable and makes the implementation processes of E-Gov initiatives vulnerable to failure,
especially when funding from these donors ends [10]. Hence, most of the survey respondents have expressed their agreement on funding issues and centralization of funding for government agencies regarding the development and implementation of E-Gov systems in Afghanistan. Based on the survey conducted, of the 387 survey participants, 126 were neutral in their opinion, 127 agreed, 44 disagreed, with only 9 stating their strong disagreement on the survey item. There is an evident difference in the number of participants on the polar opposite side of the Likert, which identify funding issues as a significant barrier to E-Gov system implementation in Afghanistan.

**PL1:** The laws and regulations that can block or facilitate the progress of E-Gov initiatives were considered potential barriers [5]. Successful implementation of the E-Gov initiative requires a consistent and effective legal framework. However, the existing elementary legal framework for information communication technology must be reviewed for faster and more secure ICT adaptation in governance [11]. As shown in Table 2 and Figure 11, most of the survey respondents expressed their agreement and strong agreement on the lack of legal bases and comprehensive policy of E-Gov systems in Afghanistan. And based on the conducted survey, of the 387 survey participants, 112 were neutral in their opinion, 153 agreed, 46 disagreed, with only 9 stating their strong disagreement on the survey item. In stark contrast, the polar opposite side of the Likert shows the lack of comprehensive legal bases and practical legal framework for E-Gov system development in Afghanistan.

**PL2:** Lack of clarity in the privacy policies of government agencies is considered a significant barrier. Therefore, data sharing between government agencies should be done in a transparent and controlled manner, which protects the citizen’s identity and sensitive information [8]. Additionally, ensuring adequate security and privacy in E-Gov strategy has been frequently cited as a barrier. The information management policy standard and guidelines must be reviewed periodically to ensure that policies are adequate for e-service delivery. Government websites should use privacy notices on how citizens’ information is used and how it is collected [9]. As shown in Table 2 and Figure 12, most of
the survey respondents expressed their agreement and strong agreement on the lack of security rules, policies, and privacy laws of E-Gov systems in Afghanistan and considered them as barriers to E-Gov systems within the public sector. Hence, based on the conducted survey, of the 387 survey participants, 104 were neutral in their opinion, 98 expressed their strong agreement, 122 agreed, 46 disagreed, with only 9 stating their strong disagreement on the survey item.

**PL3:** Several government institutions perceive themselves as owners of a particular data set and are highly protective about sharing that data with other government agencies. Therefore, this unwillingness to share data acts as a barrier against E-Government system implementation. [8] Subsequently, as shown in Table 2 and Figure 13, most of the survey respondents expressed their agreement and strong agreement on the way data ownership is a barrier to the E-Gov system implementation among different government institutions within the public sector of Afghanistan. Hence, based on the survey conducted, of the 387 survey participants, 130 were neutral in their opinion, 89 expressed their strong agreement, 111 agreed, 57 disagreed, with only 7 stating their strong disagreement on the survey item. There is an evident difference in the number of participants on the polar opposite side of the Likert.

**PL4:** Lack of political and management support refers to the lack of leadership, while the lack of coordination is highlighted as an inter-organizational barrier against E-Gov initiatives [7]. Subsequently, as shown in Table 2 and Figure 14, most of the survey respondents expressed their agreement and strong agreement on the lack of political commitment and coordination among government institutions as a barrier to the E-Gov system implementation within the public sector of Afghanistan. Hence, based on the survey conducted, of the 387 survey participants, 125 were neutral in their opinion, 89 expressed their strong agreement, 111 agreed, 37 disagreed, with only 19 stating their strong disagreement on the survey item.

**PL5:** In the literature on E-Gov, the digital divide is considered a critical barrier against E-Gov initiatives [7]. The digital divide refers to the gap between “haves” and “have-nots” with respect to information communication technology (ICT) across different countries. The digital divide is created due to a lack of infrastructure, such as access to electricity, the internet, computer, mobile devices, and modern technology in developing countries. Moreover, low literacy rates, high poverty rates, the slow pace of technology adoption, lack of initiative for infrastructural development, and high corruption rates are also considered potential reasons for the digital divide [1]. As shown in Table 2 and Figure 15, most of the survey respondents expressed their agreement and strong agreement on the digital divide as a barrier to the E-Gov system within the public sector of Afghanistan. Hence, based on the survey conducted, of the 387 survey participants, 125 were neutral in their opinion, 95 expressed their strong agreement, 111 agreed, 41 disagreed, with only 15 stating their strong disagreement on the survey item. The evident contrast in the polar opposite side of the Likert shows the
digital divide as a prominent barrier to E-Gov system development in Afghanistan.

B. SPEARMAN RANK CORRELATION ANALYSIS

Spearman rank correlation is used as a statistical method to analyze the linear relationship between the strategy, policy, and legal barriers in Likert scale variables. This method elaborates any significant correlation between the variables. The correlation between the two variables is signified by the letter P and measured with a number, which differs between $-1$ and $+1$. Zero means there is no correlation, where 1 indicates a complete or perfect correlation. The sign P shows the direction of the correlation. A negative P means that the variables are inversely related—the strength of the correlation increases from 0 to $+1$ and 0 to $-1$. Spearman rank correlation is often used when the same rank is repeated multiple times in a small dataset, such as Likert scale survey values [13].

As shown in Figure 16, the majority of the variables have either strong, moderate or weak positive correlations with one another, with only one weak negative association and five variables that are not associated with one another. The survey item St1 – the absence of implementation guidance for E-Gov projects has a positive relationship with survey items St2, St3, and St4, meaning there is a tandem dependency between the mentioned variables. Hence, we can conclude that in order to have a clear vision, management strategy, realistic milestones, while maintaining shared goals and objectives of E-Gov, it is essential to draft and implement comprehensive implementation guidance for E-Gov system development within the public sector of Afghanistan. Although the government of Afghanistan has developed several policies and strategies, such as MoCIT’s E-Gov strategy, published in 2011 in cooperation with the United Nation University International Institute for Software Technology, and NSIA’ s Digital Foundation Strategy for Afghanistan to direct government attention for three years (2019-2021), addressing issues around the building of digital foundations, still there is perceived a lack of required implementation guidance details [17], [18].

Furthermore, we can see a positive correlation of 0.5 between survey item PL1—lack of legal bases and comprehensive policy for E-Gov and PL2—lack of security rules, policies, and privacy laws. This positive relationship between the mentioned survey items indicates that to have security rules, privacy and policy law, it is essential to establish concrete legal bases and develop a comprehensive E-Gov policy for the public sector of Afghanistan. Despite the fact that MoCIT published the National Cyber Security Law of Afghanistan in 2014, and on June 20, 2017, Afghanistan President Mohammad Ashraf Ghani signed the Cyber Crime Code into law, which forms part of the country’s new Penal Code [23], [24]; due to the lack of enforcement of this law by relevant government institutions, it remained widely ineffective. Also, the survey item PL1—lack of legal bases and comprehensive policy for E-Gov system implementation has a positive correlation with PL3 data-ownership conflict. In the majority of cases, public sector institutions recognize themselves as owners of a particular set of data and are extremely protective about sharing that data with other government institutions. The dependency between PL1 and PL3 illustrates that to resolve conflict of data ownership, it is essential to establish solid legal bases by developing a comprehensive E-Gov policy that covers issues such as data ownership.

V. IMPLICATIONS, CONCLUSION, AND RECOMMENDATIONS

Based on the current study of the strategy, policy, and legal barriers facing E-Gov in Afghanistan, the Information Technology public sector needs to become aware of the existing strategy, policy, and legal obstacles. The information and results of this paper may assist the Ministry of Information and Communication Technology, National Statistics and
Information Authority, Ministry of Justice and other government institutions of Afghanistan involved in the development, draft, and implementation of E-Gov strategy, legal, and policy documents.

A survey questionnaire was prepared to conduct this paper grounded on a comprehensive literature review and distributed among 387 employees from 10 different government institutions. Moreover, the research’s descriptive and inferential statistical analysis have been visualized using R programming language’s ggplot2 and Likert library. Hence, for inferential analysis, Spearman rank correlation was also performed to analyze the correlation between the variables of interest. For the descriptive statistical analysis, visualization and description of Likert scale variables were performed. The results indicate that all respondents agreed on the existence of strategy barriers which include absence of implementation guidance, unclear vision and management strategy of E-Gov projects, over-ambitious E-Gov milestones, lack of shared E-Gov goals and objectives, funding issues and centralization of funding for government agencies. Together with policy and legal barriers, which include lack of legal bases and comprehensive policy, significant lacks occur in security rules, policies and privacy law, data ownership conflicts, the digital divide, as well as a lack of political commitment and coordination. However, based on the final results of the analysis, four obstacles out of 11 rated either agreed or strongly agreed by respondents: absence of implementation guidance for E-Gov Projects (57.82%); lack of legal bases and comprehensive policy (58.35%); lack of security rules, policies and privacy law (58.39%); and lack of political commitment and coordination (58.34%). These are considered significant barriers.

A. LIMITATIONS

The first limitation of the current paper is that all 387 survey respondents from 10 different government institutions were limited to the geographical boundary of Kabul, the capital of Afghanistan. However, future projects of a similar kind can be expanded to include participants from other provinces of Afghanistan as well. The absence of previously existing E-Gov literature in Afghanistan was one of the main limitations in this paper while conducting the literature review. Therefore, although this paper’s findings will only fill a fraction of the knowledge gap, still further research is required in this area. Furthermore, since the respondents were selected randomly, the lack of sufficient expertise among respondents appeared to be another limitation. Therefore, future studies should only include individuals with on-ground knowledge and adequate expertise in the field of Information Communication Technology and E-Gov in particular.

B. RECOMMENDATIONS

The findings of this paper contribute towards filling a fraction of the knowledge gap of E-Gov sector strategy, policy, and legal barriers. Furthermore, the result of the paper confirms the hypothesis that strategy, policy and legal barriers are among the major challenges facing effective implementation of E-Gov initiatives. Hence, as per the literature review and results of the survey participants, the recommendations of the paper are as follows:

1) Results indicate that the majority of the respondents considered the absence of implementation guidance as a significant barrier to E-Gov in Afghanistan. In 2011, the Ministry of Communication and Information Technology (MoCIT), as a step towards E-Gov system implementation in Afghanistan and filling the policy void, published a comprehensive E-Gov strategy; however, this strategy had its shortcomings in terms of implementation and content. For instance, MoCIT’s strategy did not identify the use of open source technology and did not recommend a systematic system development approach, which was later advised by DFS4A in 2019. Therefore, to fulfil the far-reaching potential of the digital transformation, NSIA introduced the Digital Foundation Strategy for Afghanistan (DFS4A), DFS4A was built on four core strategic pillars that constitute the government’s intention to address issues around building digital foundations over a period of three years (2019-2021). The DFS4A pillars were developed with the consultation of system development experts, strictly promoting the in-house development of systems and the use of open-source software [17], [18]. However, despite the positive components, DFS4A lacks the required detail to present a comprehensive systematic approach to the E-Gov system development framework, therefore remaining ineffective in detail. Hence, we recommend that besides the DFS4A, a supplemental system development framework should be drafted to provide guidelines for the in-house development of systems within public sector government institutions. Therefore, taking the factors of E-Gov system implementation into account, the recommended System Development Framework should include a summation of the following multidimensional components: 1) legal framework; 2) policy framework; 3) admin and management framework; 4) software infrastructure framework; 5) hardware infrastructure framework; 6) financial framework; 7) emergency framework; 8) social framework; and 9) awareness framework.

2) Lack of legal bases and comprehensive policy is another obstacle pointed out by the survey respondents. As primary steps to mitigate this obstacle, the Law on Electronic Transactions and Electronic Signature of Afghanistan has officially been published in the Official Gazette number 1389 dated October 28, 2020 [25]. Although, enacting this law provided the much-needed legal basis for E-Transaction and E-Commerce as well as legalizing the E-Signature in Afghanistan, still, further legal basis for E-Gov is required to fill the gap of comprehensive policy and legal bases for E-Gov. Therefore, we recommend that the government of Afghanistan, most specifically, MoCIT, MoJ, ATRA, and other relevant institutions, draft and implement an E-Gov law that incorporates not only E-Commerce, but other relevant policy and legal aspects of E-Gov as well.

3) The government of Afghanistan, in 2017, signed into law the Cyber Crime Code, which forms part of the country’s
new Penal Code [24]. However, lack of security rules, policies and privacy law as per the response of the survey analysis is considered a prominent barrier. Hence, we can conclude that the law remained widely ineffective due to the lack of enforcement of this law by government law-enforcement agencies. Therefore, we recommend that these law-enforcement bodies of the government, specifically the Ministry of Interior Cyber Crime Department, be strengthened by providing further human resources and funding.

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