E-government Adoption in Sri Lanka - Barriers and Challenges from International Perception; A Literature Review

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ABSTRACT
All symbols used in the E-government is commonly conceptualized as governments ‘use of Information and Communication Technologies (ICTs) combined with organizational change to improve the structures and operations of government. E-governments are characterized by providing increased levels of convenient efficiency to citizens, thereby ensuring a better quality of customer service and convenience in accessing better information. Regardless of how advanced a country is in terms of ICT infrastructure and deployment; many technical and non-technical obstacles must be faced in the adoption and dissemination of e-government. The understanding of e-government barriers and challenges is a significant strategic phase toward reliable and effective e-government adoption. The aim of the study is to identify barriers and challenges in adopting e-government in Sri Lanka. A range of earlier studies in India, Nepal, Nigeria, Romania, UAE have been critically examined and analysed to identify challenges of e-government. This paper then presents a critical analysis of barriers and challenges experienced in public sector organisations in the light of Sri Lankan context using an e government architecture consisted of four layers. Findings reveal that Sri Lanka faces similar challenges including financial constraints, policy barriers, infrastructure, lack of integration across government systems and organizations, change management, security risks, trust issues and low IT literacy which should be addressed in a holistic approach. Introducing a new e-government and ICT policy is recommended as an initial step to overcome the barriers and challenges.

Key words: E-government, Barriers and challenges, Sri Lanka

1. INTRODUCTION
The globalization has affected the public perspectives about the service from government and also the bureaucracy in it, ease of use of the ICT support has creating new standard from government bureaucracy (Priyambodo and Prayudi, 2015). Through the use of ICT, the public demands that government performance to be fast, cheap, and process oriented. Digitalizing services in the public sector has steadily increased in recent years, causing information technology (IT) expenditures to rise and IT infrastructures to become more complex (Haki et al., 2012). E-government is commonly conceptualized as governments' use of Information and Communication Technologies (ICTs) combined with organizational change to improve the structures and operations of government (Twizeyimana and Andersson,
E-governments are characterized by providing increased levels of convenient efficiency to citizens, thereby ensuring a better quality of customer service and convenience in accessing better information. E-government has been partitioned into four categories: Government to Citizen (G2C), Government to Business (G2B), Government to Government (G2G) and Government to Employees (G2E). (Ebrahim and Irani, 2005) has developed a framework architecture which includes four layers; infrastructure layer, e-business layer, e-government layer, and access layer which will be discussed later. Regardless of how advanced a country in terms of ICT infrastructure and deployment is, many technical and nontechnical obstacles must be faced in the adoption and dissemination of e-government (Colesca, 2009). This review will discuss the barriers and challenges faced by governments in implementing and adopting e-government in contrast to Sri Lankan situation. The paper is structured as follows; analyzing literature to explore e-government challenges and barriers, attributing them in Sri Lankan context and discussing the strategies to overcome those challenges.

2. LITERATURE REVIEW

In this digital era, both private and public organizations have become dependent on Information Technology. Evolving IT solutions create opportunities to offer services and increase transparency. Organizations have become accustomed to frequent changes in IT and operational environments. The start of e-government dates to 1980’s when personal computers were used and then in 90’s internet and computer networks were introduced and now it has come up to new tools like social media. Different countries adopted e-government at different phases and timelines. For example, developed countries were the first to use e-government concept and later it was introduced to developing and third world countries. However, with the adoption of e-government at different layers of government and public administration for service delivery, e-government implementation is subjected to various barriers, though the IT infrastructure is present, and the IT costs are low (Jaeger and Thompson, 2003). This review consists of two main parts. The first part is an overlook on the barriers and challenges in implementing e-government in different countries (Ex: India, Nepal, Romania, Nigeria, and UAE) of the world. The second part is an analysis of how these identified barriers and challenges affect Sri Lankan context. In addition, this study also attempts to discuss strategies to overcome them through international experience.

3. BARRIERS AND CHALLENGES IN E GOVERNMENT INTERNATIONAL EXPERIENCE

3.1. India

According to (Banswal et al., 2017) India’s e-governance transformation initiatives started in the 1990s. Since then, the country has made considerable progress in the Information and Communication Technology sector. To improve IT performance and productivity, the government of India approved the National e-governance Plan in 2006 which seeks to improve delivery of government services to citizens and business (“National e-Governance Plan,” 2018). Same authors have identified four categories of challenges for e-government in India namely, environmental and social challenges, economic challenges, technical challenges, and human resource challenges. Environmental and social challenges include unawareness, different languages, illiteracy, low IT literacy, recognition of applications, user friendliness of government websites, confidence on technologies provided by government, service accessibility, struggle to change, population, lack of integrated services, middle man practices (brokers), lack of demo, promotional activities & advertisements, and lack of participations of society, public and private sectors. Poverty, cost, maintenance of electronic devices, low per capita income, limited financial resources have been listed as economic challenges. Authors also describe a range of technical challenges including institutions, training centers & infrastructure, privacy and security, scope of applications, interoperability, scale of applications, geographical problems, local language,
multimodal interactions, tried and tested technologies, the main link of interdepartmental information. Limited human capital pool, lack of institutional structures and inadequate capacity building are some of the HR challenges faced by Indian e-government.

3.2. Nepal

Nepal has been facing numerous challenges during service delivery while implementing e-government. In his research survey, (Giri, 2019) has put forward several insights on obstacles and prevailing problems in public service delivery through e-government in Nepal. Poor physical infrastructure, Information Technology Act and Policy, awareness of people on IT, commitment of leadership, lack of budget, not in government’s priority are the identified obstacles. Among prevailing issues in Nepal, petty interest in leadership, lack of proper planning on HR development, lack of institutional memory, frequent changes in laws are highlighted.

3.3. Romania

In 2003, as the starting point of e-government in Romania the National Electronic System (NES) was created regarding some measures to ensure transparency in the exercise of public dignities, public functions and in business environments (Gabriela et al., 2011). Although it began in 2003, the implementation of e-government system is not currently completed in Romania. Providing public services through the National Electronic System was to be achieved gradually, under three steps. However, experience has shown that there are major shortcomings in implementing the e-government system, especially regarding equal access to public information. As presented by authors the obstacles for e-government appear in four broad categories; regulatory, financial, technological, and human, being linked and interdependent. Regulatory barriers refer to the difficulty with which it has been adopted or applied to the legislation that deals with the legal framework required to implement the e-government system in Romania. In the case of digital signature legislation in addition to ordinary barriers such as recognition, adoption, etc. there are included religious criticism. The financial obstacles concern the lack of resources necessary for each administration in order to implement the e-government system, the budgetary allocation for this area is very small or nonexistent. The technological obstacles relate to the compatibility of various systems within the administrations in order to create a common basis, to the absence of mandatory standards applicable to all administrations. Human obstacles fall into two broad categories. First, the need for an increased number of IT specialists and the ability to meet the new tasks arising from the computerization of the administration. Secondly there is a cultural barrier between citizens and technology that leads to the restriction of communication between citizens and administration. Many people do not have the knowledge necessary to work with a computer, which leads them far from the e-government system and letting them remain within their traditional services. These obstacles delay the implementation of the e-government services, or they even make impossible their implementation in Romania.

3.4. United Arab Emirates

UAE’s initiative body for e-government was a department called “E-government”, which was changed to the “Dubai Smart Government Department” in 2013. A study by (AlKhouri, 2013) revealed that the majority of E-government portals and systems in UAE are being used for sharing information or cataloguing. (Alketbi, 2018) identifies some challenges and barriers as follows; strategy barriers, technological barriers (lack of architecture integration and infrastructure, lack of data standards, lack of resources, different security models), policy barriers, organizational barriers (absence of organizational motivation, slow government transformation, no internal management and technical capabilities, change management), culture, security and trust, e-readiness, user’s trust and demographics.
3.5. Nigeria

Nigeria has a lot to gain from the potential of e-government; however, the implementation has not reached optimum capacity to generate that full multiplier effect in the public sector reform (Nchuchuwe and David, 2015). Although e-government is growing in Nigeria in a slow but steady fashion, the emergence of General System for Mobile communication (GSM) network in 2001 contributed to the economic growth of the country. (Lawan et al., 2020) describes misplacement of priority as a significant challenge to the effective implementation of e-government in Nigeria. Similarly, ICT infrastructural deficiency, low IT literacy, privacy, and security of data of implementing agencies and e-government users and weak legal frameworks have become challenges not only in Nigeria but throughout the African region. As a technical challenge, (Ajayi, 2007) raised concern of power and electricity particularly in Africa as a major reason for poor implementation and usage of e-government.

4. CHALLENGES AND BARRIERS FOR E-GOVERNMENT ADOPTION IN SRI LANKA

E-government has been viewed as an institutional mechanism to spur efficiency, effectiveness and equity in the public sector in order to attain improved public service delivery (Cordella and Iannacci, 2010). Apart from citizens’ pressure, international pressures on governments locally cannot be ignored as well. countries are being pressurized to join in the e-economy and be part of the global market (Ifinedo and Davidrajuh, 2005). Therefore, governments around the world are introducing e-government as a means of reducing costs, improving services for citizens and increasing effectiveness and efficiency at national, regional and local levels of the public sector (Alshehri and Drew, 2010). Sri Lanka has no other option regarding this and has initiated several e-government platforms for service delivery. The Government of Sri Lanka first recognized the need for the development of ICT through the National Computer Policy (COMPOL) of 1983. The Information and Communication Technology Agency of Sri Lanka (ICTA) was established in July 2003 and pursuant to Information and Communication Technology Act No. 27 of 2003, (ICT Act) and became the apex ICT institution of the government. The “e-Sri Lanka Development Project”, formulated during the period 2002-2005, is aimed at taking the dividends of ICT to all segments of Sri Lankan society and to further the socio-economic development of the nation. Subsequently the Information and Communication Technology (Amendment) Act, No. 33 of 2008 has empowered ICTA to formulate the National ICT Policy.

![Figure 1: Architecture Framework of E-government](source: Ebrahim and Irani, 2005)

In order to define barriers and challenges, the architecture of e-government should be identified properly. The e-government architecture defines the standards, infrastructure components, applications, technologies, business model and guidelines for electronic commerce among and between organizations that facilitates the interaction of the government and promotes group productivity. (Ebrahim and Irani, 2005)
has developed a framework architecture to incorporate it with integration applications and interaction tools. This framework will be used to discuss the barriers and challenges regarding Sri Lankan context. Figure 1 shows the architecture framework of e-government which is divided into four layers: access layer, e-government layer, e-business layer, and infrastructure layer.

4.1. Infrastructure Layer

This layer focuses on technologies that should be in place before e-government services can be offered reliably and effectively to the public. The potential of these technologies is to support and integrate the operations of information systems and applications in e-business layer across organizations (Figure 1) by offering the necessary standards and protocols through network and communication infrastructure approaches (e.g. intranet, extranet, and internet). Shortage of financial resources, cost of installation, operation and maintenance, shortage of reliable networks and communication (Dillon and Pelgrin, 2002), inadequate network capacity or bandwidth (Fletcher and Wright, 1995), lack of resources standards and common architecture policies and definitions, inadequate security of government hardware and software infrastructure, lack of risk management security are the related challenges in this layer regarding Sri Lankan context.

4.2. E-business Layer

This layer is focused on using ICT applications and tools to harness a network of trust, knowledge sharing and information processing that takes place both within and between organizations (Moodley, 2003). Practically, it integrates front-end e-government layer applications, such as online catalogues and transaction interfaces in the government portal with back-end activities such as existing databases and data warehouses.

Lack of integration across government systems (Moon, 2002), lack of knowledge regarding e-government, interoperability, high complexity in understanding the processes and systems in order to redesign and integrate them, absence of privacy of personal data (Lambrinoudakis et al., 2003), high cost of security applications and solutions (NECCC, 2000), unauthorized external and internal access to systems and information, lack of IT training programs in government (Bonham et al., 2001), shortage of well-trained IT staff in market (Heeks, 1999), lack of employees with integration skills (Ho, 2002) and resistance to change are the common barriers in this layer.

4.3. E-government Layer

This layer is about integrating digital data of various organizations into a web-portal of government services, in the form of a one-stop e-government portal. This may result in improved access to government resources, reduces service-processing costs, and enables organizations to provide a higher quality of service (Ho, 2002; Sharma and Gupta, 2002).

The challenges include threats from hackers and intruders (Gefen et al., 2002), threats from viruses, worms and trojans (Joshi et al., 2001), high cost of IT professionals and consultancies (NECCC, 2000), user friendliness of websites, lack of risk management security program, lack of coordination and cooperation between departments (Burn and Robins, 2003), lack of effective leadership support and commitment amongst senior public officials (Heeks, 2001).

4.4. Access Layer

This involves the channels that government users can access the various government services. Government users can be citizens, businesses, employees, other governments, and other community members. Low IT literacy, language barriers, resistance to change, lack of public trust, lack of knowledge for security risks and consequences (Zeichner, 2001), cultural issues, geographical problems (not having internet coverage) are major challenges related with this layer.

Considering the four layers, authors identify common issues for all layers including policy barriers, financial constraints, low infrastructure, lack of integration across government systems and organizations, change management, security risks, trust issues and low IT literacy as highly
challenging factors for e-government in Sri Lanka.

5. DISCUSSION AND CONCLUSIONS
The understanding of e-government barriers and challenges is a significant strategic phase toward reliable and effective e-government adoption. Regardless of how advanced a country in terms of ICT infrastructure and deployment is, many technical and non-technical obstacles must be faced in the adoption and dissemination of e-government (Colesca, 2009). There are several barriers restricting the implementation of e-government infrastructure, which prevent the realization of benefits. The authors first identified challenges and barriers in different countries of the world through literature and attempted to attribute them in the Sri Lankan context. When comparing with other countries though there were many similar situations, they were always not applicable to Sri Lankan scenario. For example, factors like population which highly affect a country like India would not be considered in Sri Lankan situation. There are many differences between countries, each one with its own beliefs, cultures, multidimensional views of using technology, and differencing capacities (Gupta et al., 2008; Sultan and Sultan, 2012), and for this reason, the similar differences can have different roots in two countries. According to the United nation’s latest e-government survey in 2018, Sri Lanka was ranked at 94 in e-government development index (EGDI) and it is the leading country in South Asia. Therefore, some of the challenges faced by developing Asian and African countries are different from Sri Lanka. Ranks of other countries discussed in literature are shown in the Table 1.

It will be easier when these barriers and challenges are identified in layer wise in order to treat them in a holistic approach. Introducing a new e-government and ICT policy can be recommended to overcome most of the challenges mentioned. Sri Lanka’s present e-government policy which was introduced in 2008 and subjected to reviews annually has ten policy objectives with thirty-two (32) policy statements. By the looks of it, this covers many essential areas for e-government but even after a decade it is still not adhered by government organizations. One major aspect that is to be developed is that, though this policy statements about inclusiveness of marginalized people, there are no guidelines on how to do it. Even the trilingual policy is mentioned only for websites. But language barrier should be addressed when using most of the applications in government. A policy statements says, “All government organization should use common shared applications for reducing the duplication of effort thus increasing the efficiency of the Government”, but no such process has been taken into action so far. It is also suggested to include a budgetary level approach in the policy to allocate funds for e-government processes like infrastructure in order to avoid financial constraints. A policy to attract skilled IT professionals to government sector and to address security risks are lacking in current document. Therefore, it is recommended to strengthen this e-government policy by law in a way that all government organizations must implement them collaborating for a connected government. This would address many of the prevailing challenges and barriers for e-government in Sri Lanka.

Table 1. EGDI Ranks 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>EGDI Rank 2018</th>
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<tbody>
<tr>
<td>UAE</td>
<td>21</td>
</tr>
<tr>
<td>Romania</td>
<td>68</td>
</tr>
<tr>
<td>India</td>
<td>96</td>
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<tr>
<td>Nepal</td>
<td>117</td>
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<tr>
<td>Nigeria</td>
<td>143</td>
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