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Societal E-Readiness for E-Governance Adaptability in Pakistan

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Abstract

The idea of e-governance is being appreciated and worked upon at various levels, however, this research focuses on the need of various workings before e-governance mechanisms can actually be made operational. The literature suggests that any policy or reform that does not cater the local context and fulfill all pre-requisites is likely to face serious hurdles and therefore might not reap desired results. The prime focus of this research is to test the societal e-readiness in connection with the idea of e-governance adaptability in the context of Pakistan. Recently, in Pakistan, several initiatives have been taken by government in order to shift towards this IT based governance structure from the traditional mode of governance. Based on the data collected from 312 university students and professionals, the developed model was tested using covariance based structural equation modeling (SEM) and the findings reveal that basic operational knowledge, networked society and availability of infrastructure respectively, are important facilitators that strengthen E-Governance adaptability. Apart from this inferential analysis, descriptive statistics were also used to identify various hurdles that people perceive regarding e-governance adaptability and it was found that resistance to change and lack of awareness are the biggest hurdles that people in Pakistan believe in the context of e-governance adaptability. Not just at the operational or practical level, the study also adds to the literature on new public governance theories.

Keywords: e-governance, societal e-readiness, availability of infrastructure, networked society, basic operational knowledge.

1. Introduction

Electronic Governance or E-Governance generally refers to the use of electronic applications to interact with the citizens of the country in order to improve the service delivery. The world is getting revolutionized through digitalization opportunities. Information and Communication Technology (ICT) is one of the tools to implement E-

governance. On the other hand, those governments are generally referred to as E-governments who basically govern through practices including electronic means (Ud din et al., 2017). There is a key role of ICT in implementing E-governance by using internet as the most innovative way to reach the citizens (Gajendra e al., 2012). In recent times, along with technological advances and with the boom of Information Technology (IT) industry, governments have started using creative ways to interact with the citizens through simple applications under the umbrella of public innovation (Sharma et al., 2014).

Adapting recent governance trends, governments usually prefer to decentralize their powers, no matter they belong to developed or developing countries. The purpose of the devolution of power is to reduce the distance with citizens which in result promises to give better and swift public service delivery to the citizens. Such steps are keenly observed in developed worlds and supported by well-known international institutions like United Nations (UN) and World Bank (World Bank, 2012). According to Clement (2018), presence of "E-Government Services" is becoming increasingly popular, where according to the E-Government Development Index (EGDI), Denmark was ranked highest among all nations with an index of 0.9150, whereas Pakistan struggles with an index of 0.25 to 0.50 (United Nations, 2018).

Unfortunately in developing countries, even after the devolution of powers from federation to provinces or states and formation of local governments, it has been seen that institutions often fail to provide public services in a fair and transparent manner due to conflict of interests or political interests (Akram et al., 2007). In order to address such issues, the model of E-governance can play a vital role in bringing citizens close to the governmental institutions and thus enabling a relatively smooth service delivery. However, there has been no study conducted so far on societal e-readiness for E-governance in Pakistan. Hence, the need arises to study the impact of societal e-readiness on E-governance adaptability.

After the 18th amendment in the 1973 constitution of the Islamic Republic of Pakistan, several functions of federation had been devolved to provinces and local governments. Pakistan is one of the developing economies in the world. E-governance was firstly introduced in Pakistan in 2002 and there has been significant improvement in ICT since that time. Electronic Government Directorate (EGD) was founded under the ministry of Science and Technology for the proper implementation of E-governance mechanisms (Shaikh et al., 2016). There were number of significant steps taken by Government of Pakistan (GOP) under EGD including the increase of mobile phones and speed/access of internet nationwide. Telecommunication sector in Pakistan has gone through various changes in regulatory and structure perspective. Digital revolution came to Pakistan after

the introduction of "Next Generation Mobile Services" (NGMS), also known as 4G Long Term Evolution (LTE) services. Later, cellular operators have also shown impressive interest in the expansion of their networks. Looking at this, Pakistan Telecommunication Authority (PTA) decided to launch Smart Pakistan initiative in order to further revolutionize ICT in the country (Ud din et al., 2016). As per latest survey done by PTA (2019) in response to Smart Pakistan initiative, number of 3G/4G subscribers have reached to 61 million whereas broadband users have reached up to 63 million of the population of 220 million by the end of December, 2018. According to Digital Pakistan Policy (2018), promotion of E-governance through better ICT tools and more digital inclusion is the foremost priority. Despite several such initiatives, according to the latest Global IT Report (2016), Pakistan still stands at 110 out of 139 countries on the Networked Readiness Index.

With the expansion of ICT in Pakistan, government seems to be in a better position to implement E-governance mechanisms. However, E-governance adaptability depends upon e-readiness. E-governance covers three broad groups; government itself (G2G), businesses or interest groups (G2B) and citizens (G2C). Business and Citizens are strategically important for the government and exists in external domain of the government whereas government itself falls in internal domain (Backus, 2001). This study is centric towards citizens' perspectives (G2C) as researchers want to explore the societal e-readiness in order to effectively implement E-governance.

For societal e-readiness, one needs to have required physical infrastructure available along with necessary ICT facilities which can be used in routine life in work or school with the knowledge of ICT's basic operations in networked society (Center for International Development, 2005). Societal e-readiness is very important to determine as far as effective implementation of E-governance is concerned. The prime purpose of this paper is to identify the effect of societal e-readiness on E-governance adaptability in Pakistan along with the identification of hurdles towards implementation of E-governance and strategies to overcome the barriers.

According to the literature, societal e-readiness can be studied through dimensions of societal e-readiness and e-governance adaptability (Bishins, 2000; Sahai & Singh, 2017). Societal e-readiness dimensions include availability of infrastructure, basic operational knowledge and networked society and it also includes e-governance adaptability. Hurdles in implementing e-governance need to be addressed as well as it has been observed that government can implement digitalization of public services in urban cities due to the access of basic available infrastructure and better literacy rate, whereas in rural areas the situation is quite opposite due to unavailability of basic infrastructure and relatively less

literacy rate and lesser income groups (Joshi, et al., 2017; Zahid, 2018). Literacy rate is important in the sense that citizens should understand the common language and know the basic use of internet. Recently, Government of Pakistan (GOP) has launched the online Citizen's Portal application (an online complaint mechanism) that is majorly in English language, which basically eliminates access to majority of population due to language barrier. According to Qureshi (2019), there are approximately 1 million registered members of online citizen's portal whereas registered users of 3G/4G and broad band users are above 60 million each. Despite increasing importance, limited work has been done on E-Governance in general and Societal E-Readiness in specific, however, as per Wirtz and Kurtz (2017), limited evidence exists on effective implementation of E-Governance. Therefore it is significant to review and improve fundamentals before large scale application of this policy. This study might be helpful for the policy makers where societal e-readiness can play its vital role in E-governance adaptability, and how can government intervene by taking necessary steps to improve societal e-readiness in order to make their e-governance initiatives successful. Provided the context, objectives of the study are as follows:

- To find out the relationship between availability of infrastructure and E-governance adaptability in Pakistan
- To examine the relationship between basic operational knowledge and E-governance adaptability in Pakistan
- To explore the relationship between networked society and E-governance adaptability in Pakistan
- To determine the possible barriers in implementing e-governance in Pakistan

1.1 Significance of the Study

Technological advancements have transformed operations of the whole world including governance model as governments now-a-days are focusing more on use of electronic and digital means for governance instead of traditional practices for service delivery, and in this regard Pakistan is of no exception. GOP has revamped digitalization policy in 2018 in order to implement E-governance mechanisms to improve public service delivery. GOP is trying to communicate with citizens through digital platform, however, there is a gap in literature regarding societal e-readiness for implementing E-governance. This study is significant in identifying the issues and hurdles related to E-governance adaptability in Pakistan and to measure the impact of societal e-readiness on E-governance adaptability.

As far as the theoretical contribution of this study is concerned, agency theory plays pivotal role in making this study theoretically significant as agents and principal relationship is supposed to be based on norm of reciprocity and self-interests. However, ICT somehow reduces the layer of agents in organizations by replacing them with technology (Palvia & Sharma, 2007). This is where Transaction Cost theory also comes into play where minimization of the layer of agents reduces the cost of the organization and in turn provides more efficient public service delivery (Singh, 2008). Moreover, practical contribution of this paper is related to the guiding tool for policy makers and public sector organizations as establishing the importance of societal e-readiness can assist them in implementing E-governance in a better and effective way.

The following sections of the paper highlight relevant literature, theoretical framework, the research methodology used to collect data and the statistical analysis using covariance based SEM. The manuscript ends with a detailed discussion of the findings, followed by conclusions and implications.

2. Literature Review

Use of ICT is gaining immense importance in the field of public governance since the last decade. There are number of developed countries using web portals to connect citizens to the governments (UN, 2008). Canada and United Kingdom both have official electronic portals to connect with the citizens for ensuring fast public services delivery which is one of the key components of democratic governments or participative governance (Norris, 2005). According to Page (2015), the fundamental idea of e-governance is to deliver services efficiently and effectively, enabling governments to achieve transparency through citizen participation.

2.1 Defining E-Governance

Concept of 'E-Governance' is in the limelight for past few years. It is generally perceived that those governments who opt for e-governance can produce better results as compared to traditional means of governance such as the traditional bureaucratic paper based systems that lack the access of citizens to the government. E-governance is meant to increase effectiveness and government's responsiveness towards citizens (Liton & Habib, 2015). This can be true for mostly developed countries and few developing countries, but the key problem lies in the societal e-readiness whether society or citizens are ready to interact with government electronically in case of developing countries where literacy rate is relatively low and infrastructures are weak (Sahai & Singh, 2017). E-governance plays vital role in dealing with the inefficiency issues (Banerjee, 2016). Moreover, e-governance is one of the key tools as public sector innovations.

E-governance also known as 'electronic governance' is the use of ICT for public sector (Holmes, 2001; Okot-Uma, 2000). It can be defined as "Public sector's use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective". Moreover, the key objective of e-governance is "to engage, enable and empower the citizen" (Verma et al., 2005).

UN definition of e-government is taken as public innovation whereas e-governance can be taken as innovation in management processes of public sector. The term "innovation" has been taken into many themes including tools, project efficiency, communications, and partnerships. These themes have been used in developing Innovation Management Measurement Framework (IMMF) (Adams et al., 2006). In one of the studies, researcher has taken IMMF as initiatives of innovation (Potnis, 2010). So, one can say that over the past few years, e-governance has been used as public innovation by various countries. Identification of need of e-governance is crucial, as it should not be a waste exercise by any government. Agency theory can guide this concept in a better way as according to the theory; there are two parties i.e. principal and agents. Principal is basically the "owner" whereas agents are considered as "employees" or "managers". It is important for the principal to have an eye on agents so that they do not become the victim of pursuance of self-interests. With the increase in size of an organization, number of agents also increases; therefore, it is not easy for managers to manage such number of employees. Hence, ICT can play vital role in flattening of the organizations by reducing the size of the organization resulting in high performance (Palvia & Sharma, 2007). This concept is basically one of the rationales of e-governance and illustrates the need of advanced e-governance mechanisms in developing countries as well.

2.2 Societal E-Readiness

Societal e-readiness seems to be very important while implementing electronic governance mechanisms. Societal e-readiness simply means whether the society is ready to adapt any sort of electronic means to communicate like Information and Communication Technology (ICT). According to Sahai and Singh (2017), societal e-readiness can be measured through i) knowledge about benefits of operating in a networked world ii) availability of infrastructure iii) basic operational knowledge, and iv) easy user friendly e-tools. First measure is about whether citizens have knowledge about networked world that this is good for the society? Various educational institutions can be the guideline for the people to get knowledge regarding ICT and its benefits. Second measure is about the network access whether there is proper infrastructure available to implement ICT. Such infrastructure includes information structure, internet availability,

internet affordability, network speed and quality, hardware and software and service and support. Third measure is about the basic operational knowledge regarding ICT that means whether people are aware of how to operate any technological application? Lastly, how much the electronic tools are easy to use and whether people find it easy to use any sort of electronic tool provided by ICT?

Societal e-readiness is considered to be one of the important tools for e-governance (Sahai & Singh, 2017). The problem with the developing countries seems to be the lack of basic infrastructure, less operational knowledge and less access to the internet. In a scenario where there is no proper infrastructure available, it seems to be a waste exercise of improving governance through e-governance (Dada, 2006). On the contrary, if society is ready for electronic and ICT usage and feels ease in using the electronic applications, then e-governance can be one of the fundamental steps as public sector innovation and can yield sound results in future in terms of economic growth and better institutions. Yadav et al., (2019) concluded on the basis of a study in India that, if citizens are "inclined" towards the use of technology, then e-governance can be successful.

2.3 Barriers to E-Governance

There have been few studies conducted on success of e-governance (Börner & Hegger, 2018; Hassan & Lee, 2019), but little studies have been done on barriers of e-governance (Tang et al., 2019; Wirtz et al., 2019). Barriers to e-governance have been divided in to three groups i.e. phases, domains and types (Meijer, 2015).

The first stage is about the start of the phase with idea of introducing the e-governance. In this phase, many interpretative barriers can arise as a result of hindrance of many market players to this idea (Dougherty, 1992). The second phase considers that idea has been generated. It is crucial that organizational resources are scarce and limited; therefore, selection needs to be done by looking at organizational and political constraints (Margetts & Dunleavy, 2002). According to Eynon and Margetts (2007), as the idea has been selected, therefore, it needs to be tested on some small scale to check the viability of the idea. Technological and institutional constraints can play vital role in this phase. Fourth phase considers that idea has been selected and there is a need to promote the idea of e-governance. Most possible constraints in this phase are about capacity and financial resources (Bekkers et al., 2011). As the idea has been tested and promoted, now this is the time to disseminate the idea into real life situation. Here, again the barriers towards idea can be organizational, technological and acceptability level of the people (Eynon & Margetts, 2007).

Second barrier to innovation is in difference of domains i.e. citizen barriers and governmental barriers. Former barrier is related to the 'digital divide' that is difference of opportunities to learn skills to understand technology is identified as a key barrier (Van Deursen & Van Dijk, 2011). Secondly, if the citizens have some sort of trust deficit in the government then it will be very hard to connect citizens with governments through digital means (Margetts & Dunleavy, 2002). Governmental barrier is related to the capacity issues such as lack of technical expertise, organizational resources constraints such as financial troubles, and lack of management and political support (Moon, 2002; Schwester, 2009).

Lastly, barriers to e-governance can be structural and cultural. Lot of discussion has already been done on structural barriers to e-governance. Cultural dimension is of dire importance too. There have been number of examples in organizations that have developed such values that do not appreciate any type of technological change rather put forward huge resistance towards such change (Margetts and Dunleavy, 2002). One should take into account all these barriers to e-governance in order to implement in its true spirit. As citizens may resist to this change and can be the biggest hurdle in implementing electronic governance, therefore, government should consider all the barriers prior designing and implementing e-governance strategies.

2.3.1 Overcoming barriers to E-Governance

Following strategies can be devised in order to overcome the barriers to electronic governance. Initially, Return on Investment (ROI) should be measured after implementing the intervention and should be seen that what percentage of revenues have been increased after intervention, so that all concerned stakeholders get an idea that the intervention was effective and needs to be carried on long term basis (Schwester, 2009). Later, if the initiatives of e-governance sticks to incentives then stakeholders can work in better way as lot of researches have shown positive correlation between performance and incentives (Eynon & Margetts, 2007). Moreover, the concept of "chaotic coordination" can be introduced which means that organizations can continue with old structure whereas facelift can be done in order to implement this public innovation (Eynon & Margetts, 2007). Then, structural barriers to pubic innovation can be reduced by involving citizens and giving them proper access to the technology on lower or no cost (Margetts & Dunleavy, 2002). Lastly, if government is able to convince citizens just like civil servants that electronic means of communication is good for them and gives proper access to them, then it is possible to overcome structural barriers.

2.4 Dimensions of Societal E-Readiness & E-Governance adaptability

As discussed by Bishins (2000) in case of societal e-readiness, e-governance adaptability is important. According to Bishins (2000), societal e-readiness dimensions include availability of infrastructure, basic operational knowledge, and networked society. Sahai and Singh (2017) concluded that availability of infrastructure is found to be positive towards implementation of e-governance. Whereas, according to Smitha et al. (2012), availability of infrastructure is associated with e-governance. Furthermore, Rahman (2010) identified that, basic operational knowledge is also associated with the implementation of e-governance. Similar case was observed in another study where basic operational knowledge is found to be associated with e-governance (Peristeras & Tarabanis, 2004). Lastly, Networked society is one of the components of e-governance (Bishins, 2000). Here, it is important to note that there have been very few studies conducted on the relationship between societal e-readiness and e-governance adaptability; therefore, researchers have used factor analysis to use valid items for this study. On the basis of the aforementioned literature, researchers have developed following hypotheses;

- **H_1:** Availability of infrastructure enhances E-governance adaptability
- **H_2:** Basic operational knowledge enhances E-governance adaptability
- **H_3:** Networked society enhances E-governance adaptability

3. Theoretical Framework

Along with the development of the society, governance mechanisms have also evolved in this contemporary world. Governance paradigm has been shifted from "New Public Management" (NPM) to "New Public Governance" (NPG) with the inclusion of public private partnerships and citizen's participation. Now, governments under NPG are expected to be more responsive towards citizens and are required to be relatively more accountable. Moreover, NPG includes collaborative structures with shared leaderships of all relevant stakeholders (Runya, *et al*, 2015). Governments have introduced electronic governance in order to make processes more transparent and accountable by connecting them with citizens efficiently and effectively. Prior to NPG, NPM was more focused towards privatization and included contracting out of services. Citizen centrality as co-producer in terms of designing and implementing policies (NPG) contrasts with old traditional approach of state-led policies (Public Administration) and market based governance (NPM).

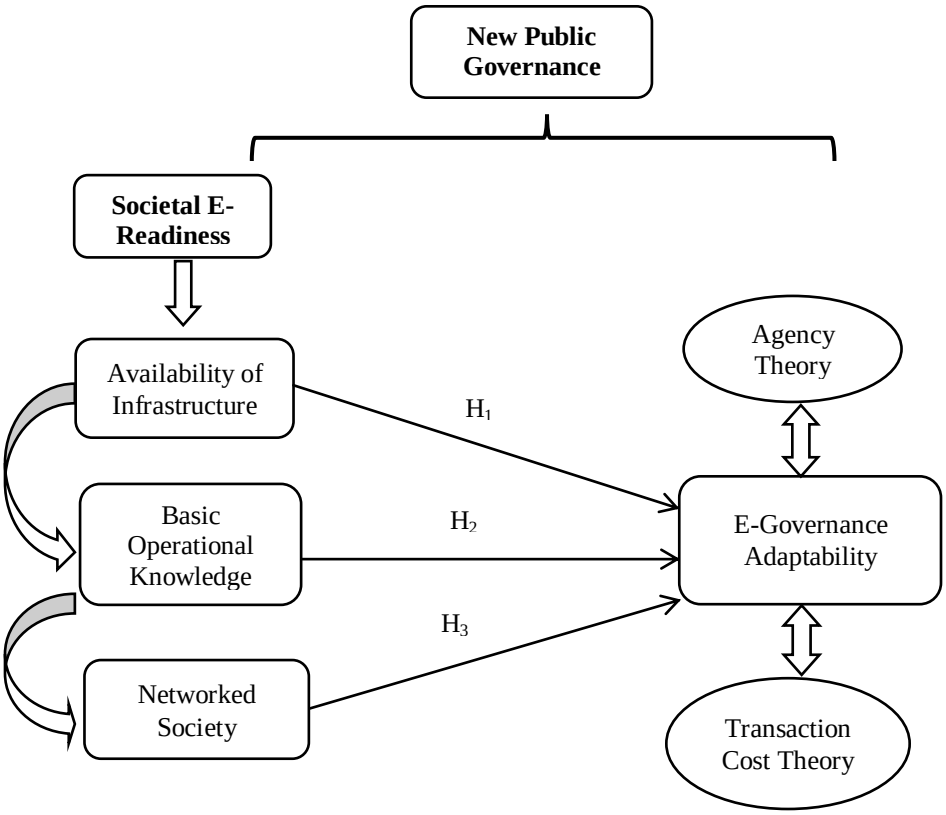

Figure 1: Theoretical Framework

Societal E-readiness is one of the key prerequisites for E-governance, where governments try to make environment and infrastructure more feasible and friendly towards implementation of E-governance. Societal E-readiness is operationalized in terms of three dimensions i.e. availability of infrastructure, basic operational knowledge, networked society (Sahai & Singh, 2017).

Referring to the framework above, agency theory, as discussed in literature, is a crucial element in this study where principal and agents play important role in organizations. Agents are mostly influenced by self-interests; therefore, it becomes difficult for principals to control them. With the introduction of ICT, technologies are replacing

agents and organizations are becoming flat (Palvia & Sharma, 2007). This is exactly the same idea behind implementation of E-governance which can ensure higher transparency by flattening the hierarchies and yield better results with high performance.

As far as Transaction Cost theory is concerned, as per Saeed and Khan (2017), organizations are meant to exchange value in response to service delivery. Transaction cost aims at providing maximum output against costs. When issues of efficiency and effectiveness arise in an organization and costs are higher due to asset specificity, then organizations decide to maintain certain functions in order to get rid of increased costs (Robbins, 1987). According to Singh (2008), use of ICTs can help economic development and service delivery by reducing transaction costs. Similarly in case of governance, governments have to act in cost effective manner with maximum output and that is possible through implementing e-governance. In the present study for Pakistan, we have to first observe the extent of societal e-readiness level and on the basis of it, we have to suggest best possible mechanisms for implementing e-governance as public innovation.

4. Methodology

This study is quantitative in nature and follows cross sectional research design. Primary data is collected from 312 university students and professionals. Reason for selecting students and professionals is that they have to interact with technology the most. According to Harper (2018), technology has become ubiquitous in class rooms and university student- teacher interaction has also increased due to the online facilities available. Hence, role of technology has greatly influenced student's learning capabilities. Therefore, units in this sample can give better insights about the area under study. Students were selected from University of the Punjab, Lahore by using simple random sampling technique for selecting the departments at first stage and students in second stage by collecting the data from Registrar office of selected departments in order to prepare the sampling frame. Reason for opting Punjab University is that it has over 45,000 students enrolled and 13 different faculties available which cater the diversification need of researchers. As far as sampling strategy for professionals is concerned, same strategy was applied for selecting professionals as data was collected from five fast moving consumer goods (FMCG) companies and data was randomly collected from middle level and top level hierarchy.

As far as instrument for this study is concerned, researchers have adapted the instrument developed by Harvard University Guide (Bishins, 2000). The items were modified by looking at the specific setting of Pakistan. The instrument has three components. First is

about the demographics of respondents, second is about the hurdles faced by respondents (if any) regarding E-Governance and third about measurement of societal e-readiness dimensions and e-governance adaptability. Questionnaire was sent to 380 respondents, however, 312 questionnaires were returned with response rate of 82.1%. Unit of analysis for this study is 'individuals'. Moreover, AMOS software is used in order to conduct the Confirmatory Factor Analysis (CFA) and test the structural model.

5. Data Analysis and Discussion

This section starts with demographics and then leads to the hurdles faced by respondents in adaptation of E-governance. In second stage, CFA is conducted. On basis of CFA, construct reliability and validity are calculated. After CFA, path model is drawn to test the hypotheses.

Table 1: Descriptive Statistics

Latent Variable	Mean	SD
AOI	3.21	0.45
BOK	3.44	0.52
KS	3.08	0.49
E-Gov	3.34	0.62

As per table 1, means of AOI, BOK, KS and E-Gov are 3.21, 3.44, 3.08 and 3.34 respectively which show that the means are relatively on higher side than average of 2.5 and reflect the positive tilt of respondents towards all latent constructs. Moreover, standard deviation ranges from 0.45 to 0.62 which represents the limited values dispersion around the mean. Moreover, as far as sample composition is concerned, sample is composed of almost equal proportion of 168 males and 144 females. University students and professionals are selected as respondents where 177 are students and 135 are professionals. Lastly, most of the respondents are of 19-23 age (43.6%), 31.1% respondents are of 24-28 age, 14.1% are of 29-33 age, 7.7% are of 34-38 age and only about 4% fall under 39 and above category. As depicted in Table 1, in this study sample about 75% respondents are less than 30 years old, hence mostly representing youth of Pakistan.

Table 2: Hurdles in E-Governance Adaptability

Hurdles in E-Governance Adaptability	N	%
Resistance to Change	133	42.6%
Lack of Awareness	71	22.8%
Lack of Internet Availability	06	1.9%
Local Language Barrier	58	18.6%
Lack of Privacy and Security	33	10.6%
Others	11	3.5%
Total	312	100%

As per table 2, the biggest hurdle in E-governance adaptability is resistance to change as 42.6% of the respondents reported it as their prime concern. Secondly, 22.8% respondents think lack of awareness is the next major hurdle in E-governance adaptability. Thirdly, most of the websites are in English language and 18.6% respondents think that this is also one of the big hurdles in E-governance adaptability, whereas, 10.6% respondents said that lack of privacy and security was also the hurdle in adapting E-governance practices and lastly, only 1.9% respondents said that there was an issue of internet availability.

5.1. Analysis of Measurement Model

The purpose of measurement model is to eliminate those factors who do not properly load on the latent constructs.

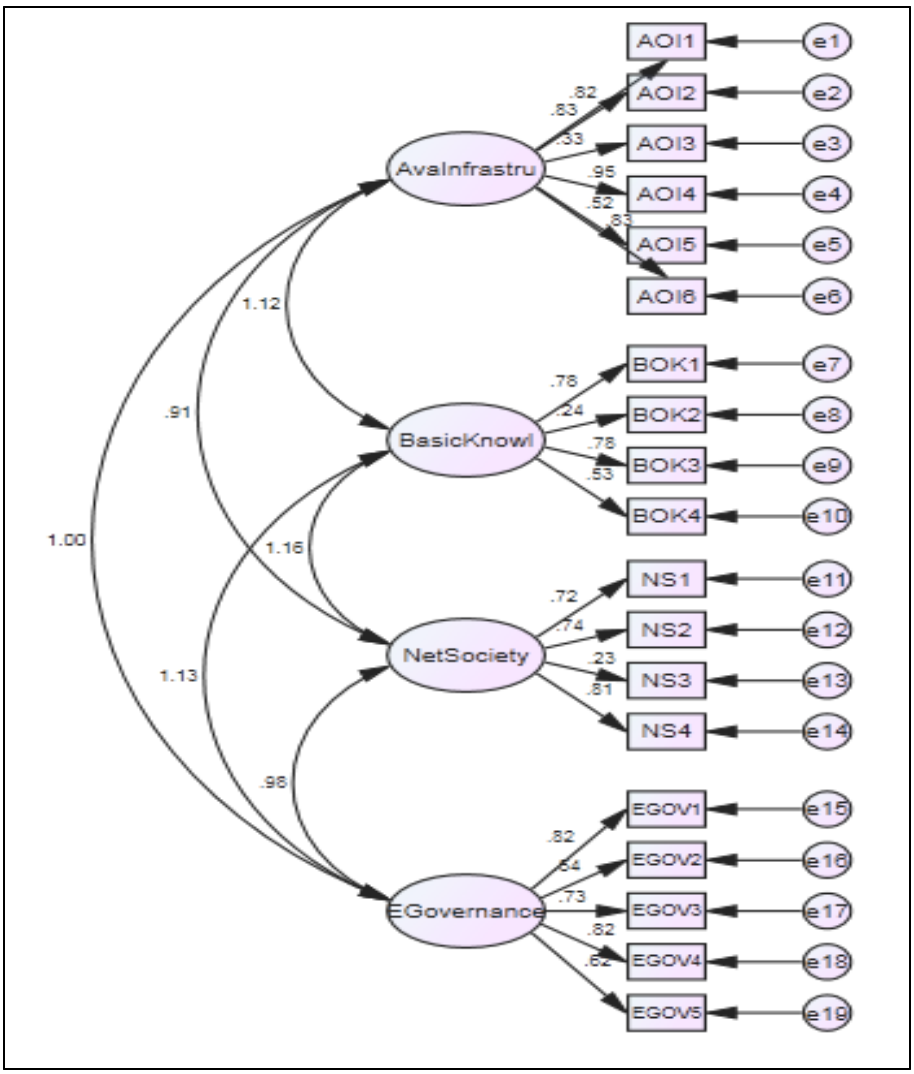

Figure 2: Measurement Model (Confirmatory Factor Analysis)

Figure 2 represents the measurement model for this study. According to this model, it can be seen that there are reasonable factor loadings present in the model for each latent construct.

Table 3: Standardized Regression Weights

Items			Estimate
AOI1	<---	Availability of Infrastructure	.816
AOI2	<---	Availability of Infrastructure	.828
AOI3	<---	Availability of Infrastructure	.328
AOI4	<---	Availability of Infrastructure	.952
AOI5	<---	Availability of Infrastructure	.519
AOI6	<---	Availability of Infrastructure	.830
BOK1	<---	Basic Operational Knowledge	.780
BOK2	<---	Basic Operational Knowledge	.245
BOK3	<---	Basic Operational Knowledge	.776
BOK4	<---	Basic Operational Knowledge	.535
NS1	<---	Networked Society	.725
NS2	<---	Networked Society	.742
NS3	<---	Networked Society	.232
NS4	<---	Networked Society	.811
EGOV1	<---	E-Governance Adaptability	.816
EGOV2	<---	E-Governance Adaptability	.538
EGOV3	<---	E-Governance Adaptability	.732
EGOV4	<---	E-Governance Adaptability	.821
EGOV5	<---	E-Governance Adaptability	.616

Factor loadings are calculated using Amos and the threshold regarding factor loadings is 0.5 i.e. factor loadings exceeding 0.5 can be retained for structural Model (Hair *et al*., 2006). In this case as shown in table 3, AOI3, BOK2 and NS3 factor loadings are less than 0.5 and therefore have been removed before testing path/structural model. CFA is used to test whether the tool is valid and reliable in the specific setting of Pakistan.

Table 4: Reliability, Convergent and Divergent Validity

	CR	AVE	AOI	BOK	NS	EGOV
AOI	0.89	0.64	0.80*			
BOK	0.74	0.51	0.48	0.71*		
NS	0.80	0.58	0.57	0.69	0.76*	
EGOV	0.83	0.51	0.31	0.69	0.65	0.71*

* $\sqrt{AVE}$

For testing construct reliability and validity, composite reliability, convergent and discriminant validity measures are used. In case of construct reliability, Composite Reliability (CR) measure is used to test the construct reliability and the threshold value for CR is 0.7-1.0 (Nunnally & Bernstein, 1994) and the table 4 suggests that the values are all within the desired range from 0.74 to 0.89. To prove convergent validity, three assumptions need to be fulfilled. Firstly, composite reliability values must be greater than 0.7. Secondly, Average Variance Extracted (AVE) must be greater than 0.5 (which is the case in this study as AVE values range from 0.51 to 0.64) and thirdly, standard loadings should be greater than 0.50 which is also fulfilled in this study (Hair *et al*., 2006). As far as discriminant validity is concerned, correlations among variables should be less than the √AVE (Hair *et al*., 1998) and it can be concluded from the table 4 that √AVE values are higher than the correlations. In the nutshell, construct reliability and validity are proved and structural/path model is ready to be tested.

Moreover, it is also observed that change in single factor in the study can change the whole model. Therefore, Common Method Bias (CMB) test is used with the help of Harman Single Factor Test (HSFT) to test this phenomenon. In this case, threshold for the variance is 0.50 i.e. variance should not exceed 0.50 and in this research, HSFT's value is 0.38, hence it is concluded that there is no issue of CMB (Podsakoff & Organ, 1986). There is another method to test CMB with the help of "Common Latent Factor" (CLF) test (Gaskin, 2012). Researchers have also used CLF test to check CMB by comparing "Standardized Regression Weights" (SRWs) without and with CLF and found that "SRWs without CLF were higher than SRWs with CLF" by having difference less than 0.05, hence it is again concluded that there is no issue of CMB.

5.2. Structural Model using SEM

After conducting CFA, researchers have imputed data for making composites in order to test the relationships between exogenous variables (Availability of infrastructure, Basic operational knowledge and Networked society) and endogenous variable (E-governance adaptability). Figure 3 represents the structural model using SEM.

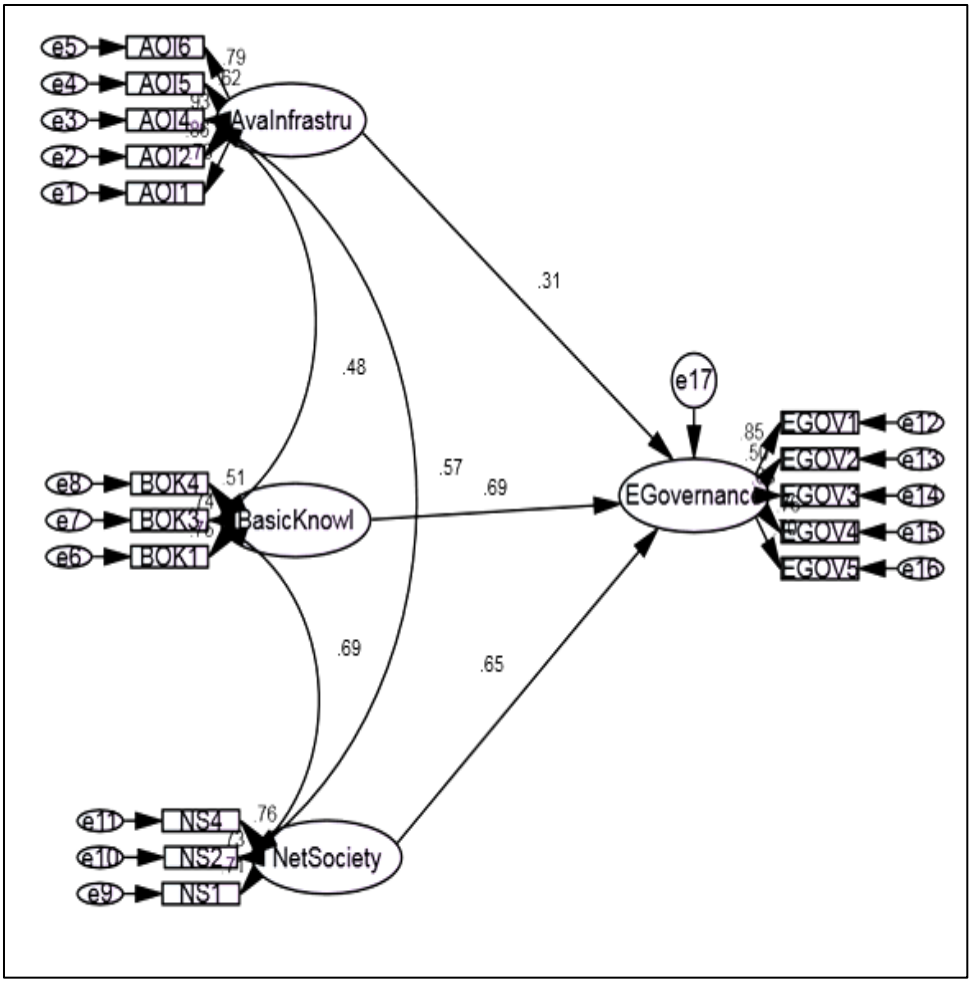

Figure 3: Structural Model Using SEM

The purpose of the structural model is to test the relationships between exogenous constructs and endogenous construct as shown in figure 3. Moreover, structural model also tests the fitness of model as shown in table 5.

Table 5: Model Goodness Fit Indices

MCMIN/DF	RMSEA	GFI	NFI	CFI	TLI
2.14	0.054	0.908	0.924	0.906	0.932

First of all, for checking the model significance, MCMIN/DF value is analyzed (Bollen & Long, 1993) and the threshold is 5 i.e. MCMIN/DF should be less than 5 (Wheaton et al., 1977). In table 5, it can be seen that MCMIN/DF value is 2.14 which is well within the range. Achieving this value within desired range shows that model is reasonably fit to tests the relationships. Other measure i.e. "Goodness of Fit Index" (GFI) is used to check the goodness index. It measures the "proportion of variance that is accounted for by the estimated population covariance" (Tabachnick and Fidell, 2007) and as per table 5, GFI is reported as 0.908 and the threshold is 0.90 i.e. GFI exceeding 0.90 predicts goodness of the model. Similarly, "Normal Fit Index" (NFI) is used to measure incremental fit of the model and in this case its value is reported as 0.924, that must be more than 0.90 (Bentler & Bonett ,1980). As far as "Comparative Fit Index" (CFI) is concerned, which is termed as absolute model fit and is taken as strongest measure of model fitness, it's value should also exceed 0.90 and as per table 5, CFI is 0.906 which is acceptable and same goes for "Tucker-Lewis index" (TLI). TLI is commonly used for small sample, however, this study is based on reasonable sample that is why TLI value is on higher side i.e. 0.932 (McDonald & Marsh, 1990). Lastly, RMSEA value is acceptable below 0.080 and perfect below 0.05 and in this case, RMSEA is 0.054. This measure shows the positive bias and small sample shows higher bias however, in this study RMSEA value is well within range (Browne & Cudeck, 1993).

According to figure 3, structural paths are illustrated between exogenous and endogenous constructs. AOI has path coefficient of 0.31 with E-Governance showing a positive relationship between both constructs. BOK has path coefficient of 0.69 with E-Governance also showing a positive relationship between both constructs. Lastly, NS has path coefficient of 0.65 with E-Governance also specifying a positive relationship between networked society and e-governance adaptability leading to the acceptance of all three hypotheses. Other than these relationships, correlations between exogenous constructs have also been portrayed in figure 3 which ranges from 0.48 to 0.69 as displayed in table 4.

5.3. Discussion

This study has identified major hurdles in E-governance adaptability and tested suitability of societal e-readiness dimensions towards E-governance adaptability in Pakistan.

Hurdles in E-governance adaptability shows that resistance to change is found to be the biggest hurdle in this study which is supported by literature as well (Alam & Hassan, 2011). Lack of awareness is found to be second major challenge in E-governance adaptability as most of the citizens were found to be not aware of current issues of governance and recent trends of technology (Khan, 2009). Though online citizen portal has introduced the option of making the profile of the person anonymous, but still conservative number of citizens are registered on the portal either due to the privacy issue or language barrier as non-native language i.e. English is used in software or websites and has been found to be the third major hurdle in E-governance adaptability (Ensafi et al., 2007).

Lack of privacy and security, as already discussed, shows that people do not trust online contents and feel that their security can be compromised even by the government (Dawes, 2008), so a serious trust deficit exists in this regard. Just 1.9% of the respondents said that lack of internet availability can be the hurdle in E-governance adaptability which shows that the penetration of internet seems to be quite healthy (Alam & Hassan, 2011) and can be seen as an encouraging factor towards expansion and implementation of the E-governance model.

Societal e-readiness dimensions have played important role in E-governance adaptability in Pakistan. Availability of infrastructure is positively and significantly related with E-governance adaptability as found in literature as well (Sahai & Singh, 2017). A similar study was conducted in Kenya and concluded that ICT infrastructure plays important and significant role adapting e-governance (Wairiuko et al., 2018). This seems to be true for Pakistan setting as infrastructure is available and established for implementing E-governance in urban areas, however, lot of work is to be done to deal with digital divide as rural areas of Pakistan are still lacking in this area (Zahid, 2018). Moreover, basic operational knowledge seems to be the highest contributing factor in this study with the positive significant relationship with E-governance adaptability as suggested in the literature as well (Rahman, 2010). Basic operational knowledge can provide better possibilities for policy makers to implement E-governance systems as if a citizen has basic operational knowledge and knows how to operate the e-tool or e-application then it may strengthen the chances for the executive of the state to implement E-governance systems more effectively. Moreover, a study was conducted in India and concluded that the knowledge society tends to perform better in adapting e-governance mechanisms (Chakraborty, 2008). Lastly, Networked society has also been found to be one of the major contributors in this study, as organizations and citizens both should have e-services i.e. ICT should be part of daily lives of citizens, and part of workplaces as well which

validate the finding towards E-governance adaptability, and calls for E-governance due to networked society (Klijn & Koppenjan, 2012). Lastly, according to Tuano (2017), networked societies are easy to implement e-governance, hence, predict a positive relationship between networked societies and e-governance adaptability.

A study was conducted in India by Patra et al. (2017) on the implementation of e-governance using covariance based SEM approach and concluded results on fitness of model using same thresholds as used in this study. Moreover, a study conducted in Malaysia also used covariance based SEM on success of e-government applications with same fit indices and concluded that e-government applications were effective using hypothesized paths (Nayan et al., 2011). From theoretical perspective, implementation of e-governance is associated with the introduction of ICT eventually leading to the replacement of employees explaining well the agency theory (Palvia & Sharma, 2007). Success of the implementation of e-governance is also associated with the controlled costs as developing countries like Pakistan are already going through economic crisis and might be in dire need of effective cost delivery mechanisms (Singh, 2008).

7. Conclusion and Recommendations

In order to make the public sector more efficient and responsive towards the citizens, governments are trying to use various IT based solutions. In this era of digitization, big data and data analytics, several revolutionary initiatives are being taken towards establishment and strengthening of E-Governance mechanism. In developing countries like Pakistan, reforms fail to meet desired objectives because they are not planned appropriately i.e. the basic ingredients or pre-requisites are not provided or established (Zubair et al., 2015). For that matter, based on the idea of New Public Governance and Network Governance, this research develops a model of E-Governance adaptability in connection with Societal E-Readiness, as to test the factors that can assist the public sector in adapting Electronic Governance Model. In order to test the model and the hypotheses, Structural Equation Modeling was conducted using AMOS based on the data collected from 312 individuals. Following the CFA, a structural model was developed and analysis led to the conclusion that all dimensions of Societal E-Readiness are significantly related with E-Governance adaptability. Basic Operational Knowledge, Networked Society and Availability of Infrastructure, all are necessary and contribute towards strengthening of E-Governance adaptability (Tuano (2017; Chakraborty, 2008; Wairiuko et al., 2018). In this rapidly changing world and the age of digitalization, citizens are more aware of the state affairs and keep an eye on all matters, the demand for accountability and efficient and effective service delivery is high and according to the literature, use of IT or ICTs are the key solutions that can aid in resolution of issues of governance (Sharma et al., 2014). There have been frequent shifts in public

administration models of governance, starting from traditional bureaucracy based system to the business based new public management system to the todays citizen involvement and participation based governance model. It is important for governments to ensure improved service delivery through different strategies and this paper attempts to highlight one such public sector innovation by an appropriate use of E-Governance mechanism after ensuring E-Governance adaptability by evaluating and strengthening Societal E-Readiness. Towards the end, it is imperative to highlight that, using descriptive analysis, various hurdles that people in general associate with the use of Electronic Systems or E-Governance models have also been identified where resistance to change or the fear of change has been identified as the biggest hurdle in this regard, therefore, a comprehensive analysis and evidence based strategy is required to introduce and disseminate the idea of this new governance model, else like several other initiatives or reforms, this intervention might not reap desired results.

7.1 Theoretical Implications

This study aims to contribute towards agency theory by explaining the mechanism of principal and agent relations which are based on self-interests and with the introduction of ICT, agents being replaced by the technology which is currently the back bone of e-governance. This study also contributes through Transaction Cost theory as transaction cost aims at providing maximum output against costs. As mentioned earlier, when issues of efficiency and effectiveness arise in an organization and costs are higher, then organizations decide to maintain certain functions in order to get rid of increased costs. Hence, these costs can be minimized or controlled by using ICT.

8. Limitations and Future Directions

Limitations of the study include limited work and literature being available on the relationships between societal e-readiness dimensions and E-Governance adaptability as not much work has been done on the dimensions of societal e-readiness. Moreover, sample is collected from urban areas only; a more holistic picture with rural based sample could be taken in order to measure the digital divide if any. Furthermore, this model might be tested in cross-cultural perspective to validate the effectiveness of this model. Lastly, technical aspects associated with E-Governance or state institutions capacity might be explored for effectively implementing the E-Governance model.

REFERENCES

Adams, R., Bessant, J., & Phelps, R. (2006). Innovation management measurement. A review. *International Journal of Management Reviews*, *8*, 21−47.

Akram, S. M., Mahmud, T., & Iftekharuzzaman. (2007). Integrity in Humanitarian Assistance: Issues and Benchmarks. In *Transparency International Bangladesh (TIB)*. Dhaka, Bangladesh.

Alam, M., & Hassan, M. (2011). *Problems when implementing e-governance systems in developing countries: A quantitative investigation of implementation problems in Bangladesh* (Masters). University of BORAS.

Backus, M. (2001). *E-governance and developing countries, introduction and examples*. [ONLINE] The Hague: International Institute for Communication and Development (IICD), pp.1-47. [ONLINE] Available at: https://bibalex.org/baifa/Attachment/Documents/119334.pdf (September 20th, 2019).

Banerjee, A., Duflo, E., Imbert, C., Mathew, S., & Pande, R. (2016). DP11761 E-governance, Accountability, and Leakage in Public Programs: Experimental Evidence from a Financial Management Reform in India. *NBER Working Paper Series*

Bekkers, V., Edelenbos, J., & Steijn, B. (Eds.). (2011). An innovative public sector? Embarking in the innovation journey. *Linking Capacity and Leadership*. (pp. 197–221). Houndmills: Palgrave MacMillan.

Bentler, P.M. & Bonett, D.G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*, 588–606.

Bishins, D. (2000). *Readiness for the networked world: A guide for developing countries*. Center for International Development, Harvard University.

Bollen, K.A. & Long, J.S. [Eds.] (1993). *Testing structural equation models*. Newbury Park, CA: Sage.

Börner, L., & Hegger, D. L. (2018). Toward design principles for sound e-waste governance: A research approach illustrated with the case of the Netherlands. *Resources, Conservation and Recycling*, *134*, 271-281.

Browne, M.W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In Bollen, K.A. & Long, J.S. [Eds.] *Testing structural equation models*. Newbury Park, CA: Sage, pp. 136–162.

Center for International Development (CID) (2002). *Community E-Readiness Assessment*. Harvard University. [ONLINE] Available at: http://www.readinessguide.org (October 27th, 2019).

Chakraborty, A. K. (2008). Symbiosis between knowledge society and e-governance. *DESIDOC Journal of Library & Information Technology*, *28*(5), 27-34.

Clement (2018). Global E-Government Development Index (EGDI) distribution 2014-2018. Statista. [ONLINE] Available at: https://www.statista.com/statistics/421582/egdi-e-government-development-index-distribution/ (February 24th, 2020).

Dada, D. (2006). E-Readiness for Developing Countries: Moving the focus from the environment to the users. *The Electronic Journal of Information Systems in Developing Countries*, 27(1), 1-14.

Dawes, S. S. (2008). The evolution and continuing challenges of e-governance. *Public Administration Review, 68,* 86-102.

Dougherty, D. (1992). Interpretive barriers to successful product innovation in large firms. *Organization Science, 3*(2), 179–202.

Ensafi, R. Zamiri, A. & Kahani, M. (2007). ICT Challenges in education: Reflections from a developing country: Iran, with reference to the statistics from computer science students. *2nd International Conference on Virtual Learning. Romania*, October 26th - 28th, 2007.Romania: ICVL. p 1-5

Eynon, R., & Margetts, H. (2007). Organisational solutions for overcoming barriers to egovernment. *European Journal of e-Practice*, *1*, 1–13.

Gajendra, S., Xi, B., & Wang, Q. (2012). E-Government: Public participation and ethical issues. *Journal of E-Governance*, 35, 195–204.

Gaskin, J. (2012). Stats Wiki and Stats Tools Package. [ONLINE] Available at: http://statwiki.kolobkreations.com/index.php?title=Confirmatory_Factor_Analysis#2nd_Order_Factors (September 19th, 2019).

Global Information Technology Report (2016). *Networked Readiness Index*. [ONLINE] Available at: http://reports.weforum.org/global-information-technology-report-2016/networked-readiness-index/ (January 24th, 2019).

Hair, J. F., Jr., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (sixth ed.). New Jersey: Prentice-Hall International.

Harper, B. (2018). Technology and teacher–student interactions: a review of empirical research. *Journal of Research on Technology in Education, 50*(3), 214-225.

Hassan, M. H., & Lee, J. (2019). Policymakers' perspective about e-Government success using AHP approach: Policy implications towards entrenching Good Governance in Pakistan. *Transforming Government: People, Process and Policy*, *13*(1), 93-118.

Holmes, D. (2001). *eGov: eBusiness Strategies for Government* (1st ed.). London: Nicholas Brealey Publishing.

Joshi, A., Deshpande, V., & Pawar, P. (2017). An application of TOPSIS for selection of appropriate e-Governance practices to improve customer satisfaction. *Journal of Project Management, 2*(3), 93-106.

Khan, S. (2009). *ICT and Education in Bangladesh*. [ONLINE] Available at: http://saburkhan.info/index.php?option=com_content&view=article&id=358:ict-and-ducation-in-bangladesh&catid=44:it-education&Itemid=73 (December 15th, 2010).

Klijn, E. H., & Koppenjan, J. (2012). Governance network theory: past, present and future. *Policy & Politics*, 40(4), 587-606.

Liton, S. & Habib, A. Md. (2015). Analysing Challenges and Opportunities of the Implementation of E-Government in Bangladesh. *Global Journal of Computer Science and Technology*, 15 (1), 20-28.

Margetts, H., & Dunleavy, P. (2002). Cultural barriers to e-government. Academic article for the report: 'Better public services through e-government'. *London: National Audit Office*, 2002, HC 704-III.

McDonald, R.P. & Marsh, H.W. (1990). Choosing a multivariate model: Noncentrality and goodness of fit. *Psychological Bulletin*, *107*, 247-255.

Meijer, A. (2015). E-governance innovation: Barriers and strategies. *Government Information Quarterly*, 32(2), 198-206.

Ministry of IT & Telecom. (2018). *Digital Pakistan Policy* (pp. 5-6). Retrieved from http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY(22-05-2018).pdf

Moon, M. Jae (2002). The evolution of e-government among municipalities: Rhetoric or reality. *Public Administration Review*, 62(4), 424–433.

Nayan, N. M., Zaman, H. B., & Sembok, T. M. T. (2011, November). Measurement model to evaluate success of e-government applications through visual relationship. *In International Visual Informatics Conference* (pp. 295-304). Springer, Berlin, Heidelberg.

Norris, P. (2005). The Impact of the Internet on Political Activism: Evidence from Europe. *International Journal of Electronic Government Research*, 1(1), 20-39.

Nunnally, J. C. & Bernstein, I. H. (1978). *Psychometric theory*. New York: McGraw-Hill.

Okot-Uma, R. W. (2001). *Electronic governance: (leading to good government)*. In Electronic Governance and Electronic Democracy: Living and Working in the Connected World. Ottawa: The Common Wealth Center for Electronic Governance. Retrieved from: http://www.electronicgov.net/pubs/research_papers/eged/chapter2.asp.

Page, K. L. (2015). E-Governance. *Wiley Encyclopedia of Management*, 1-1.

Pakistan Telecommunication Authority. (2019). *E-services.* Accessed April 8th, 2019, Available at: https://www.pta.gov.pk/en.

Palvia, S. C. J., & Sharma, S. S. (2007). E-Government and E-Governance: Definitions/Domain Framework and Status around the World. In: *In International Conference on E-governance.* [online] pp.1-12. Available at: http://governance40.com/wp-content/uploads/2019/06/E-Government_and_E-Governance_Definition.pdf [Accessed 16 Aug. 2019].

Patra, P. K., Ray, A. K., & Padhy, R. K. (2017). E-governance service deployment: an empirical study with structural equation model. *International Journal of Information and Communication Technology*, 11(4), 528-538.

Peristeras, V., & Tarabanis, K. (2004). Governance enterprise architecture (GEA): domain models for e-governance. In *Proceedings of the 6th international conference on Electronic commerce*. [online] ACM, pp.471-479. Available at: https://dl.acm.org/doi/10.1145/1052220.1052280 [Accessed 8 Aug. 2019].

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12, 69–82.

Potnis, D. D. (2010). Measuring e-Governance as an innovation in the public sector. *Government Information Quarterly*, 27(1), 41-48.

Qureshi, Z. (2019). 1m register on 'Pakistan Citizen Portal'. *GULF NEWS*. Retrieved from https://gulfnews.com/world/asia/pakistan/1m-register-on-pakistan-citizen-portal-1.64703881

Rahman, H. (2010). Framework of e-governance at the local government level. *In Comparative e-government* (pp. 23-47). Springer, New York, NY.

Robins, J. A. (1987). Organizational Economics: Notes on the Use of Transaction-Cost Theory in the Study of Organizations. *Administrative Science Quarterly, 32*, 68-86

Runya, X. U., Qigui, S. U. N., & Wei, S. I. (2015). The third wave of public administration: The new public governance. *Canadian Social Science*, 11(7), 11-21.

Saeed, A., & Khan, M. A. (2017). Impact Analysis of Privatization of PTCL in Pakistan. *Journal of the Punjab University Historical Society*, 30(2), 9-20.

Sahai, S., & Singh, G. (2017). Assessment of societal e-readiness for good governance through e-governance. *International Journal of Research in Management, Economics and Commerce*, 384(07), 24-28.

Schwester, R. W. (2009). Examining the barriers to e-government adoption. *Electronic Journal of e-Government,* 7(1), 113–122

Shaikh, A. Z., Shah, U. L., & Wijekuruppu, C. (2016). Public Service Delivery and e-Governance: The Case of Pakistan. *International Journal for Infonomics,* 9(2), 1161-1170.

Sharma, G., Bao, X., & Peng, L. (2014). Public participation and ethical issues on e-governance: A study perspective in Nepal. *Electronic Journal of e-government,* 12(1), 82-96.

Singh, N. (2008). Transaction costs, information technology and development. *Indian Growth and Development Review,* 1(2), 212-236.

Smitha, K. K., Thomas, T., & Chitharanjan, K. (2012). Cloud based e-governance system: A survey. *Procedia Engineering*, 38, 3816-3823.

Tang, T., Hou, J., Fay, D. L., & Annis, C. (2019). Revisit the drivers and barriers to e-governance in the mobile age: A case study on the adoption of city management mobile apps for smart urban governance. *Journal of Urban Affairs*, 1-23.

Tabachnick, B.G. & Fidell, L.S. (2007). *Using Multivariate Statistics* (5th ed.). New York: Allyn and Bacon.

Tuano, P. A., Lallana, E. C., Garcia, L., & Alegre, A. (2017). *Evolving an open e-governance index for network societies.* Making All Voices Count Research Report, Brighton: IDS

Ud Din, I., Xue, M. C., Abdullah, Ali, S., Shah, T., & Ilyas, A. (2017). Role of information & communication technology (ICT) and e-governance in health sector of Pakistan: A case study of Peshawar. *Cogent Social Sciences*, 3(1), 1-18.

UN E-Government survey (2008). From E-government to connected governance. *New York: United Nations.*

United Nations (2018). E-Government Survey. [online] Newyork: Department of Economic and Social Affairs, pp.85-88. Available at: https://publicadministration.un.org/Portals/1/Images/EGovernment%20Survey%202018_FINAL%20for%20web.pdf [Accessed 27 Feb. 2020].

Van Deursen, A. J. A. M., & Van Dijk, J. A. G. M. (2011). Internet skills and the digital divide. *New media and society*, 13(6), 893–911.

Verma, N., Das, V. M., & Kalra, S. (2005). *E-government tool kit for Developing countries*. UNESCO, Asia Pacific Regional Bureau for Communication and Information. New Delhi, India.

Wairiuko, J. W., Nyonje, R., & Omulo, E. O. (2018). ICT Infrastructure and Adoption of E-government for Improved Service Delivery in Kajiado County, Kenya. *European Journal of Business and Management, 10* (30), 205-221.

Wheaton, B., Muthén, B., Alwin, D.F. & Summers, G.F. (1977). Assessing reliability and stability in panel models. In Heise, D.R. [Ed.] *Sociological methodology 1977*. San Francisco: Jossey-Bass, pp. 84–136.

Wirtz, B. W., Birkmeyer, S., & Langer, P. F. (2019). Citizens and mobile government: an empirical analysis of the antecedents and consequences of mobile government usage. *International Review of Administrative Sciences*, Published Online, Sept, 28, 2019.

Wirtz, B. W., & Kurtz, O. T. (2017). Determinants of citizen usage intentions in e-government: An empirical analysis. *Public Organization Review*, *17*(3), 353-372.

World Bank (2012). *Administrative Decentralization*. [ONLINE] Available at: http://www1.worldbank.org/publicsector/decentralization/admin.htm [Accessed 11 Jun. 2019].

Yadav, J., Saini, A. K., & Yadav, A. K. (2019). Measuring citizens engagement in e-Government projects–Indian perspective. *Journal of Statistics and Management Systems*, *22*(2), 327-346.

Zahid, S. (2018). A widening digital divide. *Dawn*. [ONLINE] Retrieved from https://www.dawn.com/news/1411527.

Zubair, S. S., Jabeen, N., & Zahid, M. (2015). Evaluation of Tenure Track System in Higher Education Institutions in Pakistan: An HRM Perspective. *New Horizons*, *9*(2), 29-60.