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Master's Thesis of Public Administration

E-Government in Pakistan
An Investigation of Determinants of E-Office
Adoption in the Federal Government

파키스탄의 E-정부
연방정부에서 E-Office 채택의
결정요인에 대한 조사

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Graduate School of Public Administration
Seoul National University
Global Public Administration Major

Najeebullah Khan

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Academic Advisor Eom, Seok-Jin

Submitting a master's thesis of Public Administration

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Graduate School of Public Administration
Seoul National University
Global Public Administration Major

Najeebullah Khan

Confirming the master's thesis written by
Najeebullah Khan

December 2022

Chair Koo, Mingyo

Vice Chair Kim, Yunji

Examiner Eom, Seok-Jin

Abstract

E-Government in Pakistan

An investigation of determinants of E-Office adoption in the Federal Government

Najeebullah Khan
Global Public Administration Major
The Graduate School of Public Administration
Seoul National University

Since 1990s, countries across the world have been shifting towards E-government. Many governments have adopted different forms of technologies to render services to the citizens and businesses and exchange information within the government organizations. Adoption of technology has brought about major shift in the workings and processes of the governments across the globe.

Since independence, official business of federal government (FG) in Pakistan has routinely been carried through manual file system with hand written notes used for approvals, proposals and policy making. To replace manual filing system, the government launched E-office application suite across federal ministries and allied organizations.

This study investigated the factors that influenced public officials to adopt E-office for the official business. The theoretical framework for the study was Unified Theory of Adoption and Use of Information Technology (UTAUT) which is

amongst the frequently used models in the field of Information Systems (IS). Using survey method, 263 filled-in online questionnaires were received from public officials which were consequently analyzed with Structural Equation Modeling (SEM).

According to the results hedonic motivation (HM), facilitating conditions (FC), and external influence (EI) had significant impact on officials to use E-office whereas effort expectancy (EE) had influence on them in terms of behavioral intention (BI) as well as actual use (AU)

Maintaining the government influence through continuous monitoring and posting of tech-savvy officers as organizational heads, FG in Pakistan needs to implement the project by operationalizing all modules of E-office application suite. This will raise the performance expectancy (PE) of public officials, positively impact their BI and AU of E-office and result in reduced dependence on human resource. External factors like FC and EI work well in public settings in Pakistan; nevertheless, the personal aspects of public officials require thorough consideration while formulating and implementing techno-policy in the federal as well as provincial governments in future. The application can be further improved by integrating digital compendium of legal instruments and data analytical tools.

Keywords: (E-government, E-office adoption, UTAUT, Pakistan, Federal Government, SEM, Determinants)

Student Number: 2021-27023

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Chapter 1: Introduction

1.1. Background

Since independence, official business of FG in Pakistan has routinely been carried through manual file system with hand written notes used for approvals, proposals and policy making. The manual file system is prone to ineffectiveness, inefficiency, corruption and lack of transparency and accountability. H.U. Khan and A. Javed (2017). Official files are source of valuable information and historical records; however, on many occasions they are reported to be missing, stolen or even destroyed with mala fide intention. The loss of record stands in the way of transparency and fixing responsibility.

In 2000, the government through Ministry of Science and Technology realized the importance and benefits of Information and Communication Technology (ICT) and came up with National Information and Technology Policy as well as Action Plan. Apart from that, Ministry of Information Technology established “E-Government Directorate” (EGD) in 2002 which initiated different projects/program for promotion and development of E-government in FG. Hassan, M. (2016).

With regards to inter and intra organizational communication in the federal government, E-office, which is Government to Government (G2G) segment of E-government policy, was started at Ministry of Information Technology as a pilot project in 2004. In the second phase starting from 2007 onwards, Ministry of

Information Technology (MoIT) started its flagship project “E-Office Replication (EOR) at all Divisions of Federal Government” which became important component of “E-Government Strategy and Five-year plan”. However, due to multiple factors, the project could not produce the desirable results.

In 2014, EGD and Pakistan Computer Bureau (PCB) were merged and National Information Technology Board (NITB) was established with target to make “master action plan for E-government” for federal ministries and “strategy to deploy E-government services” for citizens. Since its establishment, NITB has been involved in E-government projects and applications through which the government addresses the needs and renders services to citizens (G2C) and to the business (G2B).

In 2015, MoIT launched E-Office system at the level of ministry to be used by the employees for data and record management. Simultaneously, its roll-out to 13 federal ministries was announced by the end of 2015-16 and subsequent use by the remaining ministries subject to procurement of IT equipment and hardware¹. Once again, the system could not be successfully replicated in all the ministries and divisions². However, since 2018, the project has been reinvigorated and fully functional IC module has been rolled out to 31 ministries and 50 attached departments.³

E-Office application suite is custom built Government Resource Planning (GRP)

¹ <https://www.dawn.com/news/1205061>

² Apart from other reasons and barriers for delayed execution, dispute with the vendor was one of them

³ 3 Year Performance Report (August 2018-June 2021) of MoITT

software developed by private vendor in compliance to the “Rules of Business” of government in Pakistan. The government exclusively owns its intellectual and copy rights. The application is a complete package and contains six modules:

- Internal Communication (IC) module
- Finance and Budget module
- Human Resource module
- Project Management module
- Inventory and Procurement module
- Internal Portal module

NITB’s website ⁴ mentions 6760 employees as active users on the E-office application whereas 8964 public officials have been trained for capacity building and as end users. The project brief estimates 80 to 85% reduction in the cost of stationary in the paperless environment.

1.2 Purpose and scope of the Study

According to the NITB’s website *“E-Office is an attempt to replace manual filing system and usher the government into the domain of paperless environment. The system is the digital version of file handling and official correspondence but with more efficiency and transparency”*

⁴ <https://nitb.gov.pk/AllProjects>

E-office is one among the main projects of the federal government. The active use of E-office by all employees will achieve a move towards digitalization and ensure transparency, efficiency and accountability. Thus, examining the factors that actually played role in adoption of E-office by federal employees is the aim of this research.

Implementing G2G segment of e-government, Government of Pakistan introduced E-office application suite which is the use of technology in the FG involving the electronic movement and tracking of files as well as archival and retrieval of data. The scope of the study is the FG employees as unit of analysis. All the respondents in this study are only FG employees who work in different organizations in Islamabad.

1.3 Research Questions and Significance of the Study

Consequent upon the above background and purpose of the research, this study will attempt to seek the answers to the below mentioned questions:

- 1.3.1 Which factors influenced FG employees to adopt E-office for official use in Pakistan?
- 1.3.2 What is the relationship of behavioral intention (BI) of FG employee to use E-office with the actual use (AU) of E-office?

Since E-Office, for G2G transactions, has recently been implemented at the scale of FG level not merely individual organization, this is going to be the pioneer study to examine the factors for adoption of E-Office by federal employees using extended UTAUT model. Being the first research on the topic, it would add value and create prospects for new research questions in the field.

The research is significant as it takes past, present and future into consideration. Looking into the past, the research evaluates the E-office project and examines factors which actually influenced the BI and AU of E-office by public officials.

Looking into the future, FG in Pakistan is slowly moving towards sequential adoption of advanced ICT in the public sector like artificial intelligence, data analytics, big data, etc. The analysis of E-office project through this study may also contribute in the form of policy guidelines and recommendations for the advanced use of ICT in the FG as well as provincial governments in future.

In nut shell, the result of the study expects to provide some policy suggestions to the government in Pakistan in general, in the context of E-office and advanced use of ICT in future.

Chapter 2: Literature Review

2.1. Overview of E-government

“The term ‘Information and Communication Technology’ or precisely ‘ICT’ means communication technologies which include computers, internet, software, cell phones, wireless networks, video-conferencing, social networking and other media applications and services.” (AIMS, FAO). Because ICT creates enabling environment to handle information in a digital form, governments have started using and relying on it to achieve their operations. Hence, the term “E-government”.

“E-government” is short form of electronic government. The terms like online, internet, digital, connected government, etc. can also be found in different literature. Grönlund (2004). E-government commonly implies the use of ICT by the government aiming to enhance its operations and structure. Field, Muller, Gadriot-Renard, Vergez. (2003).

United Nations’ E-government Knowledge base (UNeGovKB) states, “*When government gives online information and exchanges services to units of government, citizens, and businesses in electronic format, it is E-government.*”

In E-Government nomenclature, the terms (G2G), (G2B) and (G2C), are widely used. In G2G setting, government agencies share data and conduct electronic transactions digitally or online. The transactions can be at and/or across national,

provincial and local level organizations of the government. In G2B setting, the focus is on online business-specific transactions or services. Where as in G2C setting, the focus is facilitating people who interact with government in the form of consumers availing public services and participate in the consultation and decision-making process as citizens.

As of late 1990s, many countries adopted e-government or implemented e-government initiatives. Dhaou and Renard (2017). There is consensus among the scholars that E-government with its various applications has the potential to bring about positive change and improvement in the organizations as well as in the lives of people. Yimbo (2011). While implementing E-government, governments expect service delivery and transformation of its relationship with citizens, businesses and other arms of government (Grönlund & Horan, 2005).

There is no doubt that governments across the world have greatly benefitted from ICT use which has brought about revolution. Governments have capitalized on E-government while serving and informing stakeholders. The benefits derived by the governments are in terms of quality, efficiency and accountability (Alshehri et al., 2012; Dawes, 2009).

Without ICT, the performance of the government is devoid of accountability in true sense as manual systems make it difficult to make governments accountable and citizens' participations is limited. However, E-government has made it easier to

evaluate performance of governments by introducing the concepts like transparency, accountability and citizen participation (Mohammad, 2009).

2.2. Overview of ICT acceptance Models

The utility of ICT in the government or an organization is only possible if it is accepted and used by its employees. Even if the employees accept and use ICT, it is required to be accepted and used by the citizen/consumer (G2C) and businesses (G2B) to avail the services. Hence, in IS literature, explanation of acceptance or adoption of new technology is an established research area. Hu, Chau, Sheng and Tam (1999). Acceptance of ICT in the government is both an area of importance and challenge. Non-acceptance both on demand and supply side can hinder and even result into failure of E-government initiatives. The factors leading to acceptance as well as non-acceptance of ICT are necessary to be determined, analyzed and worked upon before successful execution of E-government policy or program.

Acceptance or adoption is indeed an indicator of BI and actual behavior of individuals; hence, E-government is not easily adopted by the stakeholders in all the cases. In fact, its implementation has seen barriers and even failures in different parts of the world. Ochara, Mawela and Odhiambo (2016) conducted a study to find out factors responsible for resistance towards E-government adoption in South Africa using survey design. The factors like switching costs, adaptive and maladaptive defense mechanisms were found to be resistance enablers whereas as

actors like perceived usefulness and ease of use as resistance inhibitors among the citizens. The researchers have drawn the attention towards failure factors for e-government programs and devised a suggestion that implementers of E-government should take into consideration the process of resistance by the citizens. It means that non-acceptance or non-adoption can lead e-government toward failure.

E-government denotes a change and change is not easy to be accepted. In the context of organizations, technological changes affect the working style of the employees whose BI to use new technology may be low. Such scenario will find them resisting against the AU of new technology causing barriers, non-implementation or even failure of the e-government projects within the organizations. Elgohary (2020) conducted a research by conducting survey of 400 employees of public sector in Egypt to examine the effect of employees' resistance to change. The key behavioral factor responsible for resistance to the adoption of technology was fear of public officials in terms of loss of control, insecurity, inability to implement change, and increased workload. Not only adoption factors but also resistance factors are required to be considered to avoid the failure of E-government programs.

Several theories/models have attempted to determine factors responsible for technology acceptance in different contexts. Most of these models were inspired from the theories in sociology and psychology. Each model or theory determined several factors that were believed to play key role towards technology acceptance.

Table 1: Overview of the Main Technology Acceptance Models and Theories

Theory of Reasoned Action (TRA)
“This theory was derived from social psychology and is among the central and dominant theories which define human behavior and has been used to predict various types of behaviors. Davis et al. (1989) applied this theory in the individual context of technology acceptance, the resulting variance was found to be mostly consistent with the studies that used TRA in other behavioral contexts.”
Technology Acceptance Model (TAM)
“This model is related to IS. The design of this model was used to predict usefulness in job and acceptance of information technology. Later on, a new construct by the name of subjective norm was included in mandatory settings and the resulting model was named as TAM2 (Venkatesh and Davis 2000). TAM has seen wide application in the domain of various sets of users and technologies.”
Motivational Model (MM)
“There has been wide ranging support in psychology for motivational theory which is seen to be the predictor of behavior. Many researches have adapted motivational theories in various settings. Davis et al. (1992) used the model in IS context to explain use and adoption of new technology.”
Theory of Planned Behavior (TPB)
“TPB extends TRA with new construct like perceived behavioral control and regards it to be another predictor of intention and use. The application of TPB has resulted to understand usage and acceptance of different technologies at the level of individuals (Harrison et al. 1997; Mathieson 1991; Taylor and Todd 1995b).”
Combined TAM and TPB (C-TAM-TPB)
“This model is the hybrid version of TPB and TAM.”
Model of PC Utilization (MPCU)

“Human behavior theory by Triandis’ (1977) was adapted and refined in the context of IS and used to predict utilization of PC and hence MPCU. The constructs used in the model best suit to predict usage and acceptance of various information technologies at individual level.”

Innovation Diffusion Theory (IDT)

“Since 1960s, in order to study innovations in the field of agriculture and organizations, IDT (Rogers 1995) has been used (Tornatzky and Klien 1982). Moore and Benbasat (1991) adapted IDT and improved the constructs to study individual technology acceptance by putting it in IS.”

Social Cognitive Theory (SCT)

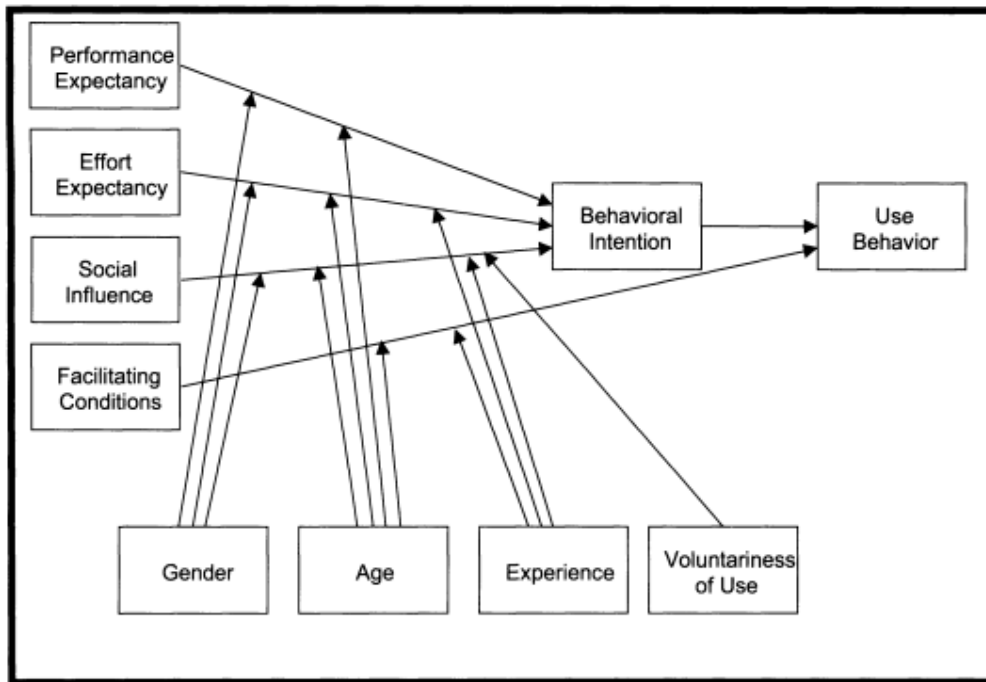
“Social Cognitive Theory (SCT) is among the main theories of human behavior (Bandura 1986). Compeau and Higgins (1995b) extended SCT and applied it in the context of utilization of computer. Additionally, they classified “use” as a dependent variable by forecasting individual acceptance.”

Source: “UTAUT; Venkatesh et al. 2003”

2.3. Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) synthesized UTAUT by considering eight technology adoption theories and models. The theory has successfully determined key factors and possibilities to forecast BI and AU of technology. The theory is reliable model of technology acceptance which accommodates variances of higher percentage. (Alawadhi and Morris, 2008). The theory has four constructs like Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitation Conditions (FC) and moderators like gender, experience, age, and voluntariness of use. The diagrammatic representation of the theory is as under:

Figure 1: Unified Theory of Acceptance and Use of Technology (UTAUT)



Source: (UTAUT; Venkatesh et al. 2003).

While studying various technologies, the theory, as base model, has been applied in organizational and non-organizational contexts. Many research studies have used the theory in its original context, different context as well as with extensions. Venkatesh et al. (2016) reveals that original UTUAUT model has been generally cited 1,205 times, integrated with another model 13 times, applied 12 times, and extended 37 times from 2003 to 2014. (Marcus et al. 2019)

2.4. Overview of E-government Maturity Models

Maturity models in e-government literature provide snapshot of country or region's standing on e-government spectrum or stages ranging from basic to advance. These stages can serve to provide overarching plan for implementation of E-government services or e-portals. The key points of some of famous maturity models are as

under:

Table 2: Layne and Lee Maturity Model

1st stage	Catalogue	The public authority is presented on the web
2nd stage	Transaction	Government-Citizen transaction takes place.
3rd stage	Vertical Integration	Integration of a system within the same jurisdictions and domain takes place
4th stage	Horizontal Integration	Integration of a system across various jurisdictions and domains of the government takes place and e- portal provides one stop shops to citizens.

Table 3: United Nations Maturity Model

1st stage	Emerging information services	Availability of static information on websites of government
2nd stage	Enhanced information services	Exchange of services via one way or simple two-way communication.
3rd stage	Transactional services	Availability and possibility of two-way communication with the citizens
4th stage	Connected services	Proactive websites request for citizens' feedback whereas the services on the government agencies are directed towards citizens and consumers.

Table 4: Hiller and Belanger Maturity Model

1st stage	Information	Posting information through government websites
2nd stage	Two-way communications	Communication between citizens and the government.
3rd stage	Transaction	Availability of online services and financial transactions for citizens' use.
4th stage	Integration	Integration of all services through single e-portal
5 th stage	Participation	Posting comments, voting and political participation

Table 5: West Maturity Model

1st stage	Bill-board	Use of websites to display information just like billboards.
2nd stage	Partial-service-delivery	Users can look for data using search engines with restricted online services.
3rd stage	Portal or one stop shop portal	Placement of every information and service under single portal
4th stage	Interactive democracy	One stop portal providing personalized services, feedback forms and push technology

2.5. Standing of Pakistan on E-Government maturity model

In the light of various stages of E-government maturity models, the current standing of Pakistan is not very satisfactory. The E-government maturity level in Pakistan can generally be deemed to be in the second stage and in some cases in third stage. The country requires rigorous and consistent efforts to reach to the higher level of E-government maturity model. According to UN E-Government survey 2020 which is published biennially, the E-government development index rank of Pakistan is 153 whereas E-participation index rank is 103. The ranking of the country has improved yet is below all South Asian Association for Regional Cooperation (SAARC) countries with exception of Afghanistan. This situation warrants government's policy intervention.

Table 6: Comparison of Pakistan on E-Government Development Index Rank

Source: UN E-Government survey 2020

Countries	E-Government Development Index (EGDI) rank in 2020	Countries	E-Government Development Index rank in 2020
SAARC COUNTRIES		TOP COUNTRIES	
Afghanistan	169	Denmark	1
Pakistan	153	South Korea	2
Bangladesh	119	Estonia	3
Bhutan	103	Finland	4
India	100	BOTTOM COUNTRIES	
Myanmar	146	South Sudan	193
Maldives	105	Eretria	192
Nepal	132	Somalia	191
Sri Lanka	85	Central African Republic	190

2.6. E-Office Maturity Model for Implementation (EMMI)

Just like E-government maturity model, NITB has designed maturity model for E-office. According to the project brief, the following definitions and EMMI have been used to indicate the level of ministries and divisions on E-office in the FG:

Table 7: Pakistan's E-Office Maturity Model for Implementation (EMMI)

EMMI	Definition	Number of ministries/division on EMMI⁵
Level 0	Organization does not have the required infrastructure, and connectivity to use E-office. Training for end-users is required to be imparted.	None ⁶
Level 1	Organization is connected to the National datacenter. Required infrastructure and user trainings have been delivered for selected sections.	All
Level 2	Organization has attained Level 1 and is using e-Office in selected sections/wings	18
Level 3	Organization has attained Level 2 and done away with hard/paper files (excluding exceptions ⁷) and is using e-Office as the only medium for internal communication purposes	2
Level 4	Organization has attained Level 3 and started inter-ministerial and divisional communication/file movement through e-Office	20
Level 5	Organization has attained Level 4 and started using other modules of e-Office suite	None

Source: National Information Technology Board

2.6. Literature Review

Siddiqui and Mehmood (2021) conducted a qualitative research on implementation and challenges of E-government in Pakistan. Interviews from provincial and FG employees were conducted on different aspects of e-government projects. The main challenges that were identified as findings of the study were resistance to change from the government officials, weak ICT infrastructure, lack of monitoring and auditing of e-government projects and lack of understanding of strategy and policy

⁵ The EMMI of the ministries/division and user count can vary from time to time

⁶ NITB's document reveals that it has imparted end-user and capacity building trainings to 10500 officials/officers whereas the user count is around 7000

⁷ Depending upon the security classification of files and nature of work, manual file system operates in parallel to E-office

by the people at the helm of the affairs.

S. Batool et al. (2021) conducted a descriptive and exploratory research using qualitative approach to discover progress of e-governance and its relation with good governance. Using the data from the government websites, the authors have focused on various e-government initiatives and services provided by the incumbent government in Pakistan. The authors have concluded that government's reactivity towards e-government has turned to proactivity which is conducive for good governance. The integration of ICT into the government's machinery is right step that will shower more benefits and facilities on citizens with the passage of time.

Ahmad, Waqas and Zhang (2020) studied public sector personnel who provided E-services in Pakistan. The study used Technology Acceptance Model (TAM). The study administered survey question at one government organization without mentioning whether it was federal or provincial organization. The outcome of the study was out that perceived ease of use and perceived usefulness, trust, and attitude were closely related to adoption of e-government system. More trust and attitude corresponded with more intention to use e-government system.

Kamal, Shafiq and Kakria (2020) conducted a research to study factors influencing

intention of patients to utilize telemedicine services in rural Pakistan. The study used Technology Acceptance Model (TAM) as theoretical framework and conducted face to face survey method. The results indicate that perceived use of ease, usefulness, trust and facilitating conditions (FC) affected the BI of respondents to use telemedicine services.

Jameel, Asif and Hussain (2019) conducted an empirical study in Pakistan to examine the relationship of good government and public trust by placing e-government as mediating factor. The research design opted for survey method and distributed 1000 questionnaire among Pakistani citizens. With the response rate of 76.3 percent, the data was analyzed through factor analysis and structural equation model. Consequently, it was revealed that e-government played intervening role between good governance and public trust

Hassan and Lee (2015) conducted an empirical study on E-government success in Pakistan using Analytical Hierarchy process (AHP) model. Public sector officials, being part of the working of government with historical knowledge, have better understanding of the factors that may lead towards the success of certain policy or program. The same applies for the E-government. Interviews from the public sector officials were taken to find out critical success factors from implementation point of view.

Mushtaq, Ahmed and Warriach (2010) conducted studies regarding the barriers and

implementation of G2G segment of E-government in Pakistan. In the first study, the authors identified eleven factors that impeded the implementation of E-government in Pakistan. In the second study, survey method was used involving government officials to validate barriers. The mains barriers which were validated by the participants were political support, legislation, failure of institutions and communication gap.

Alshehri (2013) used extended UTAUT model to determine factors of e-government services adoption by Saudi citizens. Based upon the analysis of survey questionnaire response, he found that trust, PE, EE and website quality had a direct effect on BI of respondents to use E-government services and had significant relationship with its adoption.

Performance expectancy (PE) has been an important factor in the BI to use technology. The PE construct or its equivalent in various models is the strongest predictor of intention and remains significant in both voluntary and mandatory context. “UTAUT model uses the term PE; however, its equivalent or relevant terms are perceived usefulness in TAM, extrinsic motivation in MM, job fit in MPCU, relative advantage in IDT and outcome expectations in SCT, etc.” (Venkatesh et al. 2003).

Acharia (2016) conducted a study to determine factors that resulted in acceptance of

electronic human resource management (E-HRM) system by government officials in Nepal. Using the UTAUT as theoretical framework, the author found that relationship of intention with E-HRM acceptance was significant and that of performance and effort expectancy PE and EE was positive.

Generally, the expectation of users with the technology is that it will create ease for them. Hence, EE is yet another dominant factor in the BI to use technology. UTAUT model uses the term effort expectancy; however, its equivalent or relevant terms are perceived ease of use in TAM and TAM2, ease of use in IDT and complexity in MPCU, which are found to be significant in determining the BI especially at the early stage of adoption of technology. (Davis et al. 1989; Szajna 1996; Venkatesh 1999.)

Alawadhi and Morris (2008) in their study on adoption of E-government services in Kuwait conducted survey from 880 students. Using UTAUT model and regressions analysis, the response was analyzed. The authors found that BI of students was affected by PE, EE and peer influence whereas FC and BI influenced their use of E-government services.

Salimon, Yusoff and Mokhtar (2016) did a pioneer study to test the role of HM as

mediating factor in adoption of e-banking in Nigeria. The study analyzed the questionnaire of 226 banking users on Structural Equation Model (SEM). HM was found to play mediating role between perceived usefulness, security and e-banking adoption.

Social influence is yet another important factor that plays an important role in technology adoption and takes place in both voluntary and obligatory settings. In non-voluntary situations, it appears significant at the earlier stages and with the passage of time and continuous use, the role of social influence erodes and becomes non-significant.

Hwang, Al-Arabi and Shin (2016) conducted descriptive and exploratory study by summarizing important theories and model used in acceptance of technology in mandatory settings. The authors have found that senior management generally takes decisions regarding the innovation in the organizations and the employees are expected implement the decision by adopting the innovation. In fact, the reality is that such adoption is not sustainable and does not give clear picture of what other factors influence the BI of workers towards the acceptance and use of the technology. Lack of institutionalization of innovation often results in implementation failure as employees, as the main stakeholders, limit the usage of technology which is initially thrust upon them.

Different models capture the concept of FC like IDT model uses the term

compatibility and TAM and TPB models use the term perceived behavioral control. On the other hand, MPCU uses exactly the same term like UTAUT. The operationalization of these constructs includes technological aspects and/or organizational environment that are designed to get rid of barriers of use.

Mansoor, Ibrahim and Hassan (2021) studied behavior and use of E-government services by small and medium enterprises (SMEs) in Riyadh, Saudi Arabia. The survey response from 443 respondents was analyzed through Structural Equation Model (SEM). The findings of the study showed that FC had direct impact on the use of E-government services whereas the BI served as mediating factor between FC and AU of E-government services.

Chapter 3: Research Design and Methodology

3.1. Research Design

According to the literature review, the previous studies involving UTAUT model have used survey method as the frequently used research design. This study also used survey design as primary method to collect data from public officials who constituted unit of analysis.

Since the E-office project was executed by Ministry of Information Technology and Telecommunication (MoITT) through NITB, the necessary official details of the project like project document, project brief, progress reports and feedback forms were obtained and made part of the study where required.

The study predominantly used quantitative approach; however, to interpret results of quantitative analysis and understand and describe response of public officials regarding factors impacting their adoption of E-office, qualitative approach was also used.

3.2. Survey Instrument

In the light of previous literature based on UTATUT model, a questionnaire containing 33 questions was designed on 5 point likert scale and opinion of public officials was obtained to determine the factors that influenced them to adopt E-office for official business. The questionnaire was divided into three parts. The first

part contained 7 questions on demographic information. The second part contained 20 questions on five constructs (independent/exogenous variables) i.e. PE, EE, HM, FC and EI. Each construct contained 4 questions. The last part contained 6 questions, 3 questions each on two constructs (dependent/ endogenous variables) i.e. BI and AU.

3.3. Sampling procedure

NITB issues user certificates to FG employees as authorization to use E-office. According the website of the organization, E-office suite has 6760⁸ users. Using 95% confidence level and 5 % confidence interval approach, a sample size ⁹ was determined which turned out to be 364 respondents. A list of FG organizations, whose employees were issued user certificate by NITB, was obtained. On the basis of stratified sampling method, the sample was selected.

The link of the questionnaire was directly shared with 500 FG employees including 100 IT officers in the organizations through official email address and whatsapp number where available. The respondents were also requested forward the link to other officials.

3.4. Theoretical Framework

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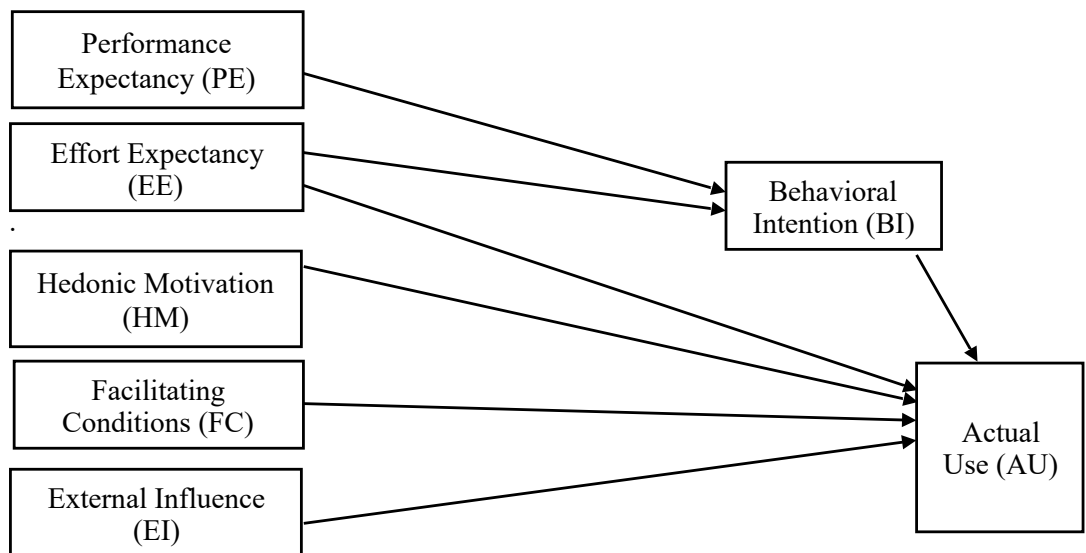
<https://nitb.gov.pk/ProjectDetail/YTZhM2Q5ZDEtNzAzNy00MjJjLWlZNGYtM2ZhM2VkOTFhNDk2>

⁹ <https://www.checkmarket.com/sample-size-calculator/>

The theoretical framework used for this study was UTAUT model with one additional construct. (Figure: 2). The constructs like PE, EE, FC, EI and HM acted as independent variables. On the other hand, BI and AU of E-office were dependent variables.

The following model aimed to determine the indirect influence of PE, EE on AU of E-office by public officials through BI which acted as mediating variable. Moreover, the model expected to find the direct influence of HM, FC and EI on AU of E-office by users.

Figure 2: Amended UTAUT model without moderators



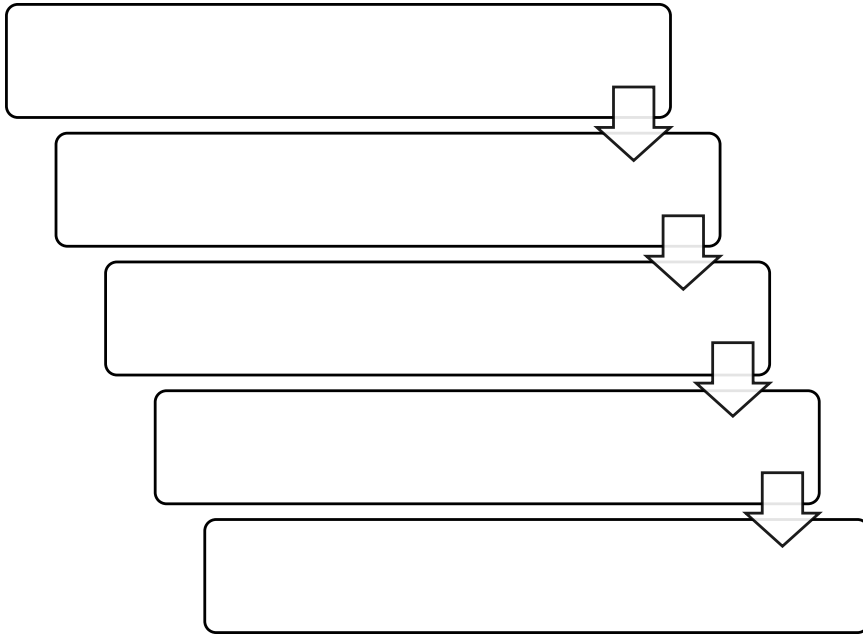
Source: Author- based on UTAUT

3.5. Analytical model

SEM is a dynamic model which synthesizes various multivariate techniques like factor analysis, path analysis, regression analysis, etc. The model is well suited in dealing with research questions involving complex constructs or set of multi-facetted relationships and/ or where the focus in on direct and indirect effects among the variables. Sturgis, P. (2016).

The data obtained from questionnaire was analyzed using Structural Equation Model (SEM). At the very outset, the theoretical model which was based on UTATU was developed which is mentioned in 3.3 and figure 2 above. The second step was to test measurement model through CFA. Acceptable model fit indices along with recommended Cronbach alpha and factor loadings were obtained. Afterwards, convergent and discriminant validity were tested through CR, AVE, HTMT, etc. Once again, the model demonstrated acceptable and recommended values. Finally, after obtaining best model fit, structural model was tested through path analysis and hypothesis testing from H1 to H6.

Figure 3: Diagrammatic representation of SEM



Source: Author- based on SEM

3.6. Research Hypothesis

In the light of the background and research questions, the study proposes to the test the following hypotheses:

3.6.1. H: 1 “PE has impact on the BI of federal employees to use E-office”

The study expects to find out the relationship of PE on BI of FG employees to use of E-office. In other words, higher level PE is expected to have positive impact on users’ intention to use E-office.

3.6.2. H: 2 “EE has impact on the BI of federal employees to use E-office”

The study expects to find out the relationship of EE with BI of FG employees. In

other words, higher level EE is expected to have positive impact on users' intention to use -office. In case users expect that the use of E-office would reduce efforts and create ease in official work, their intention to use E-office would increase or strengthen and vice-a- versa.

3.6.3. H: 2 (a) “EE has impact on the AU use of E-office”

The study expects to find out the relationship of EE with AU of E-office by officials. In other words, higher level EE is expected to have positive impact on officials to use -office. In case users expect that the use of E-office would reduce efforts and create ease in official work, their use of E-office would increase and vice-a- versa.

3.6.4. H: 3 “HM has impact on AU of E-office by FG employees”

This study expects to find out relationship of HM with AU of E-office. In other words, the level of users' fun or joy derived from the use of E-office will directly impact the AU of E-office.

3.6.5. H: 4 “FC have impact on AU of E-office by FG employees”

This study expects to find relationship between FC and AU of E-office by the FG employee. In simple words, if infrastructure and technical support exist for the use of E-office in the FG, the employee will be highly likely to use E-office and vice-a- versa.

3.6.6. H: 5 “EI has impact on AU of E-office by FG employees”

The study expects to find out find relationship between EI and AU of E-office by

the users. In other words, the higher influence of government, organizational heads and important others like colleagues on the users will have positive impact on their AU of E-office and vice-a-versa.

3.6.7. H: 6 “BI of FG employees to use E-office has impact on the AU of E-office”

The study expects to find relationship of BI with AU of E-office by the users. In fact, the study expects to determine the mediating role of BI. Higher BI to use E-office corresponds with higher AU of E-office and vice versa.

3.7. Conceptualization and Operationalization

This research attempts to examine the impact of independent variables like PE and EE on BI and EE, HM, FC and EI on AU of E-office. The research also deems BI as mediator between PE/EE and AU.

3.7.1 Performance Expectancy (PE)

PE in the context of this research means the degree to which the users believe that use of E-office in the FG will help to enhance their performance. The operational aspects of PE are the expectation of users in terms of their productivity, dependence, target achievement and overall performance in official work.

3.7.2 Effort Expectancy (EE)

In the context of the research, EE would mean the level of ease associated with the use of E-office. The operational aspects of EE are the expectation of FG employees

in terms of his/her ease to trace the location of files, learn the system, getting skilled in the system and ease associated with intra and inter-organizational communication

3.7.3 External influence (EI)

The original UTAUT model focuses only on social influence and defines it as “the degree to which an individual perceives that important others believe he or she should use the new system.” (UTAUT; Venkatesh et al. 2003). However, this research has substituted social influence with external influence. Here EI would take into consideration three aspects like influence of government, manager and individuals. Hence, the operational aspects of EI would mean the level of influence that government, organizational heads and important others exert on users that impact their decision to actually use E-office.

3.7.4 Facilitating conditions (FC)

In the context of this research, FC would mean the belief of users that necessary technical and organizational infrastructure like IT equipment, knowledge, skills, training, assistance in case of problems, etc. exist that would influence their decision to actually use E-office.

3.7.5 Hedonic Motivation (HM)

In original UTAUT model, HM does not exist as a construct; however, exists in the revised UTAUT2 model (Venkatesh et al. 2012). In the context of this research, HM

would mean fun, interest and pleasure that users derive or can derive by using E-office and which will impact their decision to use it.

3.7.6 Behavioral Intention (BI) to use E-office

BI to use E-office means the intention of FG employee to use E-office. The operational aspects would include three dimensions like personal intention, planning and prediction to use E-office

3.7.7 Actual Use (AU) of E-Office

Usage of E-office would mean the frequency of use of the application by public officials by categorizing themselves as active, willing and interested users.

Chapter 4: Data Analysis and Results

4.1 Demographic Analysis

A questionnaire on amended UTAUT model was designed on Google form and directly shared with 500 FG employees in Pakistan through Email and Whatsapp. The response was analyzed using SPSS 28 and AMOS 26 versions. The descriptive analysis and Cronbach Coefficient Alpha measures were carried out using SPSS while the Confirmatory Factor Analysis (CFA), path analysis, reliability, validity and hypothesis testing were done using AMOS.

The demographic analysis reveals that the survey was responded by 263 FG employees with the following details:

Gender		
Category	N	%
Male	197	74.9%
Female	66	25.1%
Total	263	100%

With regards to gender, three quarters were male and one quarter was female.

Age		
Category	N	%
21-30	54	20.5%
31-40	125	47.5%
41-50	55	20.9%
51-60	23	8.7%
61 and above	6	2.3%
Total	263	100%

With regards to age, around half (47.5%) of the respondents fell in age bracket of 31-40 followed by one-fifth (20.9%) in 41-50 and 20.5% in 21-30 respectively, etc.

Educational Qualifications		
Category	N	%
Intermediate	3	1.1%
Bachelors	31	11.8%
Masters	148	56.3%
M.Phil. and above	81	30.8%
Total	263	100%

Regarding educational qualifications, more than half (56.3%) of respondents were in possession of Masters followed by 30.8% M.Phil. and above and 11.8% Bachelor's degree, etc.

Work Experience		
Category	N	%
Less than 10 years	107	40.7%
10 to 20 years	113	43.0%
21 to 30 years	28	10.6%
31 years and above	15	5.7%
Total	263	100%

Regarding work experience, over forty percent (43%) of the respondents had 10-20 years of government service followed by 40.7% less than 10 years and 10.6 % 21 to 30 years. Only 5.7 had extensive experience of 31 years and above, etc.

Type of Organization		
Category	N	%
Others	20	7.6%
Autonomous body	42	16.0%
Constitutional body	7	2.7%
Executive department	49	18.6%
Ministry/division	145	55.1%
Total	263	100%

With regards to type of organization, more than half (55.1%) of the participants worked in ministries/ divisions followed by 18.6 % in executive departments like attached departments and sub-ordinate offices and 16% in autonomous bodies respectively, etc.

Official Grade (BPS)		
Category	N	%
BPS 16 and below	41	15.6%
BPS 17	55	20.9%
BPS 18	122	46.4%
BPS 19	24	9.1%
BPS 20 and above	21	8.0%
Total	263	100%

Regarding official grade, around half of the respondents fell in grade 18, followed by 20.9% in grade 17, 15.6% in grade 16 and below and 8 % in grade 20 and above, etc.

Job Status		
Category	N	%
Others	29	11.0%
Non-cadre officer	11	4.2%
Ex-cadre officer	48	18.3%
Cadre officer	175	66.5%
Total	263	100%

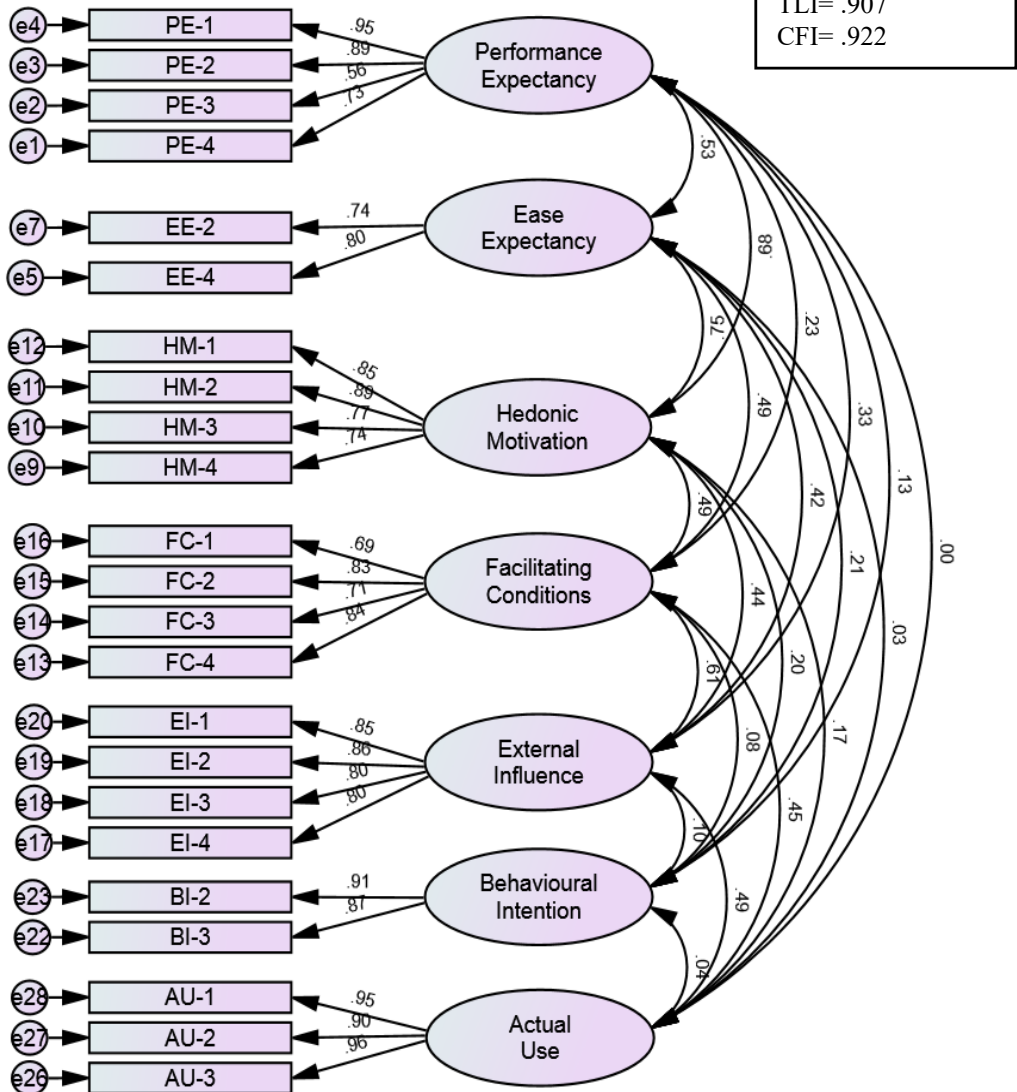
Regarding job status, 66.5% of the respondents were cadre officers, followed by 18.3 % ex-cadre and 11% other category officers

4.2. Measurement Model

To test the measurement model, CFA was carried out and model fitness, construct reliability and validity were assessed.

Barbara, (2010) suggest to carryout CFA to identify and ensure factors' suitability in the construct. In fact, it tests model fit to data. (Alhija., 2010) and validates the measurement model by dealing with various form of correlations among the constructs (Hair et al., 2010). Fitness indices help to assess construct validity. (Awang, 2015). The researchers have suggested certain level of fitness indices which, once attained, would reveal the model fitness. If the model achieves the acceptable values for model fitness, it becomes suitable to develop linkages between factors and determining contribution of variables (Jain and Chetty, 2022). Thus, it is essential to examine model fitness before assessing the linkage between variables (Kenny, 2020; Shi & Lee, 2019). As alternatives to chi-square model fit test, many fit indices have been developed (West et al., 2012). The model was tested for fitness and the recommended values were obtained;

Figure 4¹⁰: Confirmatory Factor Analysis



Source: Author- Testing measurement model through CFA in AMOS

Table 8: Model Fitness

¹⁰ To achieve model fit, the factors like EE1, EE3 and BI1 had to be eliminated

Category of fit	Index name	Index value	Recommended values
Absolute fit	RMSEA	<u>.071</u>	< 0.08 <ul style="list-style-type: none"> • Bentler, 1990 • Byrne, 2001 • Meyer et al, 2005
	CFI	<u>.922</u>	> 0.90 <ul style="list-style-type: none"> • Bentler, 1990 • Hatcher, 1994
Incremental fit	TLI	<u>.907</u>	> 0.90 <ul style="list-style-type: none"> • Bentler, 1990.
	IFI	<u>.923</u>	> 0.90 <ul style="list-style-type: none"> • Bentler, 1990 • Meyer et al, 2005
	Chisq/df	<u>2.330</u>	< 3.0 <ul style="list-style-type: none"> • Hair et al.,2009
Parsimonious fit	CMIN	<u>491.664</u>	P value > .05 <ul style="list-style-type: none"> • Meyer et al, 2005
	DF	<u>211</u> <u>.000</u>	

Source: Author- Model fitness using AMOS

According to Hinton et al., (2004), Cronbach co-efficient alpha measures internal consistency of variables and validates the reliability of the construct. Values of Cronbach can range from 0 to 1 with 0.90 as excellent, 0.70 to .90 as high, .50 to .70 as moderate and .50 and below as low. (Sideridis, 2018). Pallant, 2005 recommends these values to be at least equal and/ or above .70 in case of confirmatory analysis.

Table 9: Construct Reliability and Cronbach Alpha

	Constructs	Cronbach Alpha
PE	Performance Expectancy (F1)	.862
EE	Ease Expectancy (F2)	.729
HM	Hedonic Motivation (F3)	.874
FC	Facilitating Conditions (F4)	.821
EI	External Influence (F5)	.798
BI	Behavioral Intention (F6)	.729
AU	Actual Usage (F7)	.946

Source: Author- Data analysis using SPSS

CFA is another important technique through which we can determine reliability of a construct. According to Alavi et al. (2020), CFA is an important component of SEM and theoretical models containing empirical data can be confirmed by it. In the domain of social and behavioral sciences, CFA has acquired the status of important tool for analysis. In theory driven models, this tool captures the relationship between latent variables and observed variables through loading of observed variables (factors) on latent variables. (Mueller et al., 2001). The analysis of factor loading leads to composite reliability (Lerdpornkulrat et al., 2017). Factor loading indicates the correlation between variables and factors and explains the variance by the variable on certain factor. The acceptable factor loading measurement should ideally be greater than 0.3. Hair et al. (1998).

Table 10: Factor loadings through CFA

	Latent Variables	Factor Loadings ¹¹
PE	Performance Expectancy	
PE1	By using E-office, I will be able to process more cases in less time.	.949
PE2	By using E-office, I will be able to accomplish my targets more quickly	.889
PE3	If I use E-office, my dependence on the staff will reduce	.562
PE4	If I use E-office, I would find it useful in my job.	.729
EE	Ease Expectancy	
EE2	Learning to operate E-office is easy for me	.742
EE4	It would be easy for me to become skillful at using E-office	.799
HM	Hedonic Motivation	
HM1	I like working with E-office	.852
HM 2	E-office makes my work interesting	.888
HM 3	Working with E-office is fun	.772
HM 4	Using E-office is good idea for official work.	.741
FC	Facilitating Conditions	
FC1	I have the necessary resources/equipment to use E-office	.685
FC 2	I have the necessary knowledge to operate E-office	.831
FC 3	I can get help from others in case of difficulties while using E-office.	.707
FC4	I have been trained/guided on how to use E-office	.840
EI	External Influence	
EI1	The federal government supports the use E-office for official business	.847
EI2	My organization supports the use of E-office for official business	.858
EI3	The people whom I consider important (bosses, friends, colleagues), think that I should use E-office for official business	.796
EI4	I know that other federal government organizations also use E-office for official business.	.799

¹¹ All factor loadings were standardized

BI	Behavioral Intention	
BI2	I intend to use E-office	.914
BI3	I plan to use E-office	.869
AU	Actual Usage	
AU1	I am an active user of E-office	.950
AU2	I am a willing user of E-office	.899
AU3	I am an interested user of E-office	.958

Source: Author- Factor loadings using AMOS

“Research Methods and Knowledge Base defines convergent validity as the convergence between similar constructs whereas discriminant validity as the divergence between dissimilar constructs.” Convergent and discriminant validity tests which are deemed to be sub-types of construct validity are required to be done before path analysis and hypothesis testing in SEM.

According to (Awang, 2015; Hair et al. 2016), the acceptable value for CR should be greater than 0.7 and AVE should exceed 0.5. The table below shows that the model has achieved the acceptable value for CR and AVE and hence the reliability of the construct has been ensured. Both results of convergent and discriminant validity were obtained that were satisfactory to proceed towards path analysis and hypothesis testing.

Table 11: Composite Reliability (CR) and Average Variance Extracted (AVE)

Constructs	CR	AVE
Performance Expectancy (F1)	0.870	0.635
Ease Expectancy (F2)	0.745	0.594
Hedonic Motivation (F3)	0.887	0.665
Facilitating Conditions (F4)	0.852	0.591
External Influence (F5)	0.895	0.681
Behavioral Intention (F6)	0.886	0.795
Actual Usage (F7)	0.955	0.876

Source: Author- CR and AVE using AMOS

In order to avoid issues of multicollinearity in research involving latent variables, it becomes necessary to assess discriminant validity. (Hamid et al., 2017). Since this research uses such variables, two different methods were used to assess discriminant validity like Fornel and Larcker (1971) criterion as well as heterotrait-monotrait (HTMT) ratio of correlations method.

Table 12: Fornel and Larcker (1971) criterion

	F1	F2	F3	F4	F5	F6	F7
F1	0.792						
F2	0.533***	0.771					
F3	0.677***	0.747***	0.815				
F4	0.226**	0.492***	0.490***	0.769			
F5	0.327***	0.416***	0.444***	0.613***	0.825		
F6	0.134*	0.213**	0.201**	0.078	0.098	0.892	
F7	0.003	0.033	0.173**	0.448***	0.489***	0.043	0.936

Significance of Correlations: * $p < 0.050$ ** $p < 0.010$ *** $p < 0.001$

Source: Author- Fornel and Larcker (1971) criterion using AMOS

Table 13: Heterotrait-Monotrait (HTMT) analysis*

	F1	F2	F3	F4	F5	F6	F7
F1							
F2	0.559						
F3	0.689	0.738					
F4	0.207	0.418	0.450				
F5	0.259	0.350	0.374	0.565			
F6	0.110	0.213	0.222	0.062	0.081		
F7	0.101	0.044	0.101	0.377	0.378	0.021	

***Suggested value for HTMT is less than 0.9**

Source: Author- HTMT using AMOS

4.3. Structural Model

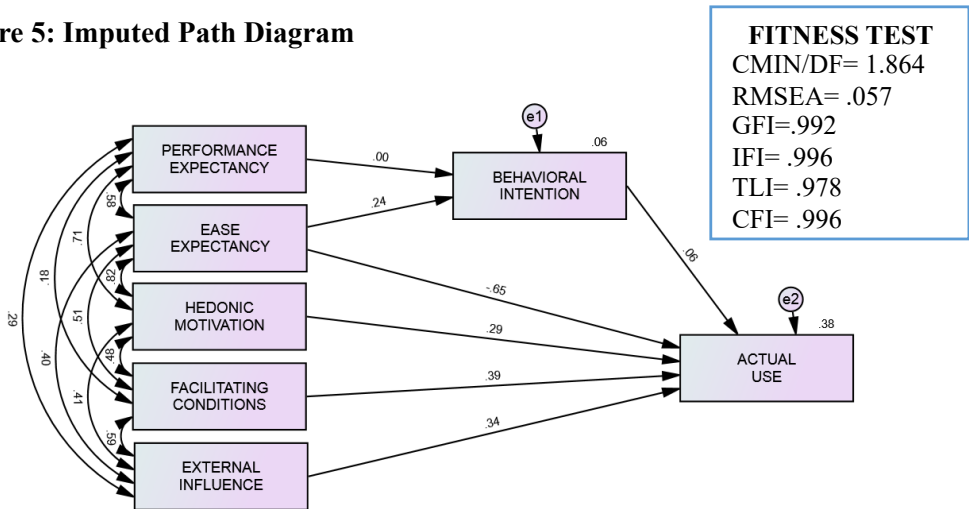
After testing the measurement model, the structural model was tested by obtaining best model fit, hypothesis testing and estimating squared multiple correlations. After obtaining best model fit (figure 4), the hypothesized relationship was tested. As per results, H2, H3, H5 and H4 were supported whereas H1 and H6 were not supported.

The squared multiple correlations (R^2) for actual use was .38 and behavioral intention.06 which means 38 % and 6% variance for actual usage and behavioral intention were explained respectively after best model fit was obtained.

The value for R^2 according to Falk and Miller (1992) are recommended to be equal to or greater than 0.10. Only in such case the variance explained can be considered adequate. Another suggestion comes from Cohen (1988) who assesses R^2 values for endogenous latent variables with the following labels like 0.26 as substantial, 0.13

as moderate and 0.02 as weak. Chin (1998) has also come up with recommendations of R² values for endogenous latent variables. Accordingly, R² value of 0.67 is considered substantial 0.33 is moderate and 0.19 weak.

Figure 5: Imputed Path Diagram



Source: Author- Path diagram using AMOS¹²

4.4. Hypothesis Testing

Based upon the results as denoted in the below mentioned table, hypothesis test reveals the following:

4.4.1. H:1 “PE has impact on the BI of FG employees to use E-office”

The results did not support the hypothesis which means that PE did not have positive impact on the intention of public officials to use E-office. Non-significant relationship between PE and BI was observed.

4.4.2. H: 2 “EE has impact on the BI of FG employees to use E-office”

¹² This is the best model fit generated by AMOS in accordance with the data

The results supported the hypothesis H2 which means that EE had significant positive impact on the intention of public officials

4.4.3. H: 2 (a)¹³ “EE has impact on AU of E-office by of FG employees”

The results supported the hypothesis H2 (a) which means that EE had significant but negative impact on AU of public officials

4.4.4. H: 3 “HM has impact on AU of E-office by of FG employees”

The results supported the hypothesis which means that HM had impact on AU of E-officer by users. Significant positive relationship between HM and BI was observed.

4.4.5. H: 4 “FC have impact on the AU of E-office by of FG employees”

The results supported the hypothesis which means that FC had positive impact on the actual usage of E-office by public officials. The relationship was found to be positive and significant

4.4.6. H: 5 “EI has impact on the AU of E-office by the FG employees”

The results supported the hypothesis which means that EI had impact on the actual usage of E-office by public officials. The relationship was found to be positive and significant

4.4.7. H: 6 “BI of FG employees to use E-office has impact on the AU of E-office”

The results did not support the hypothesis which means that BI did not have impact

¹³ This hypothesis has increased the model fit and Variance.

on the AU of E-office by public officials. Non-significant relationship between BI and AU was observed.

Table 14: Hypothesis Testing

Hypothesized relationship				Standardized Estimates	T-value	P-value	Decision
H1	Behavioral Intention	<---	Performance Expectancy	-.004	-.646	.955	Not Supported
H2	Behavioral Intention	<---	Ease Expectancy	.240	3.250	***	Supported
H2 (A)	Actual Use		Ease Expectancy	-.646	-7.279	***	Supported
H3	Actual Use	<---	Hedonic Motivation	.291	3.358	***	Supported
H4	Actual Use	<---	Facilitating Conditions	.395	6.067	***	Supported
H5	Actual Use	<---	External Influence	.338	5.518	***	Supported
H6	Actual Use	<---	Behavioral Intention	.063	1.249	.212	Not Supported

Significance of Correlations: * $p < 0.050$ ** $p < 0.010$ *** $p < 0.001$

Source: Author- Hypothesis test using AMOS

4.5. Key findings and Discussion

The study revealed that FC played significant role by influencing the public officials to use E-office for their official work. Their belief and existence of technical and organizational infrastructure like IT equipment, knowledge, skills, training, assistance in case of problems, etc. actually led the employees to use E-office. The studies like Thompson et al., (1991), Al-Awadhi and Morris, (2008) Al-Shafi and Weerakkody, (2010), Taylor and Todd, (1995) and Chang et al., (2007), etc. have also confirmed the role of FC in the adoption/use of technology.

Official records reveal that government of Pakistan spent over Pakistani Rupees (PR) 2000 million¹⁴ to implement the project and create FC for use by public officials. MoITT and NITB spearheaded this effort to make FG organizations paperless by laying e-office infrastructure, providing IT equipment and imparting trainings to FG employees. According to project brief, all ministries are connected to the national datacenter, have required infrastructure and user trainings to around 15000 officials have been imparted. NITB hired dedicated staff and IT experts who were deployed to coordinate with government organizations and resolve all kind of technical issues related to the system. At the same time, almost all FG organizations have IT section or staff available for trouble shooting in e-office application suite and helping the officials in need. They can freely coordinate and avail services from MoITT and NITB when the need emerges.

The study found positive and significant relationship between EI and AU of E-office. EI involves three aspects like influence which is exerted by government, manager and individuals on FG employees to use of E-office. In the context of technology adoption and usage, many studies have ratified the vital part played by social or external influence. (Wilska, T. 2003; Fishbein et. al., 1975; Baron, Patterson & Harris, 2006; Dholakia et. al., 2004).

In the context of implementation of E-office project and its consequent adoption by

¹⁴ <https://propakistani.pk/2022/04/15/nitb-to-introduce-new-version-of-e-office-in-divisions-and-organizations/>

government officials, external influence in the form of government guidelines and continuous monitoring and functional operation of E-office across the offices by organizational heads have played vital role. The government which took the reins of the government in 2018 implemented many reforms in the public sector including **“Performance Agreement Contract”**¹⁵. Under such agreement, a federal minister would voluntarily commit annual targets to the Prime Minister (PM) and would provide quarterly reports so that the PM office would gauge performance of the federal minister and his or her ministry. The agreement of the minister with the PM would ideally trickle down to all officers of the organization as job descriptions. Under such agreement, the performance commitment of the MoITT, apart from others, was to successfully roll out E-office across the board in the FG and extend technical support to FG officials to use it. Moreover, federal secretary of each ministry was also expected to implement E-office in the ministries and organizations falling under their administrative and financial jurisdictions¹⁶. Hence, the government vision through reforms backed by quarterly performance monitoring and progress follow up through high level fora played critical role to implement that project and influence public officials to use E-office.

Additionally, government reports highlight positive correlation of organizational heads and achieving higher levels of e-office use. For example, ministries with tech savvy and friendly federal secretaries had higher level of E-office usage compared with others. They exerted their influence on subordinates to use E-office suite for

¹⁵ <https://tribune.com.pk/story/2322210/performance-agreements-a-new-paradigm>

¹⁶ <https://www.techjuice.pk/pseb-appreciated-by-moitt-for-achieving-level-4-e-office-implementation/>

official purpose. Their influence stood equivalent to mandatory setting. Ministries have reported many instances when their EMMI level increased or decreased with the posting and transfer of federal secretaries. Such reports are clear indication of the reality that pressure of managers or organizational heads did influence FG workers to use E-office.

PE has been important factor in the BI to use technology. The PE construct or its equivalent is generally strong predictors of intention. (Venkatesh et al. 2003). Generally, there are many studies which have shown the impact of PE on BI. (Davis et al. 1989; Szajna 1996; Venkatesh 1999; Alawadhi and Morris, 2008; Acharia 2016). Contrary to the above studies, this study found insignificant relationship of PE and BI. This implies that FG officials did not deem that their performance or productivity will increase while using E-office which is why PE has insignificant impact on their BI.

According to the project documents, E-office platform is an aggregate of six modules. On ground, only IC module is functional whereas HRM, project management, finance and budget, procurement management and internal modules are not yet operational which is why PE of officers from E-office may not translate to BI to use it. Establishment division is Personnel Management office of the FG. The organization uses Performance Evaluation Report (PER) ¹⁷ to assess the performance of the public officials on annual basis, however, the performance

¹⁷ PER forms can be accessed in the forms section of the website <https://establishment.gov.pk/index>

report does not contain a single item which even mentions or takes into consideration performance evaluation in terms of processing cases through E-office application. Similarly, the system is merely digital or automated version of manual filing system and does not have inbuilt features like compendium of rules and/ or analytical tools, etc. that may give users added advantage to produce quality proposals or cases. Performance of public officials is dependent upon the quality of work not quantity of files disposed-off through the digital system. Hence, effect of PE on BI is apparently insignificant.

These above results are also in consistence with study conducted by Khalid, Lis, Chaiyasoonthorn, & Chaveesuk, (2021) using SEM to investigate factors leading to BI of students to use MOOC. They found insignificant relationship of PE on the BI of students to use MOOC. In the same manner, Attuquayefio (2014) conducted a study using UTAUT model and also found insignificant relationship Between PE and BI to use ICT by students in university in Ghana.

In I.S research, the concept of hedonic motivation (HM) has been found to influence the acceptance and direct use of technology (e.g., van der Heijden 2004; Thong et al. 2006). To determine technology acceptance and use, HM has been shown to play a significant part. (Brown and Venkatesh 2005). This study also found significant positive relationship between HM and AU of E-office. The result implies that FG employees derive fun while using E-office. It could be due to the fact that the platform has necessary features that are required for file management and record

handling. The procedures to handle manual files are mentioned in Secretariat Instructions ¹⁸ which help and guide the FG officials. In the same manner, the instructions of the secretariat instructions have been imbedded and made part of E-office in automated form. Using the features, public officials use the system to create files and documents, produce proposals for approval and exchange inter and intra organizational correspondences in rapid manner which can generate interest and joy.

Another hypothesis that tested the relationship of BI (as mediating variable) with AU of E-office was not supported by the results. The main element of an individual's behavior is behavioral intent which has significant positive influence on technology usage. (Fishbein and Ajzen ,1975). Additionally, it is in consistence with the theories that form the basis of intention models. Empirically, BI has been established to be an important predictor of user intention for adoption and use of new technology (Venkatesh et al., 2003; Sheppard et al., 1988; Taylor and Todd, 1995b). In case of Pakistan, the BI intention did not play significant mediating role. PE of public officials did not have any impact their BI; therefore, weak BI could not play significant mediating role with AU. In a study conducted by Attuquayefio (2014), insignificant relationship was also found between BI and AU of ICT by tertiary level students.

Chapter 5: Conclusion and Recommendations

This research is a pioneer study on the adoption of E-office application suite at the

¹⁸ Secretariat instructions can be accessed in Law section of the website (<https://establishment.gov.pk/>)

level of FG in Pakistan. The study used modified UTAUT model to test the factors that influenced FG employees' intention and use E-office for the official business. The study was able to receive 52.6 % response rate with 5.92% error of margin or confidence interval.

5.1. Conclusion

The results show that public officials in the country adopted E-office application suite due two set of factors i.e. external factors and internal factors. Among the external factors, FC and EI influenced public officials' decision to use E-office whereas the internal or personal factors like HM, EE were responsible for their BI and AU of the system.

Generally, FC are like barrier busters in the context adoption of technology. They do not guarantee that technology will be adopted; nevertheless, increase the likelihood of its adoption. In the same manner, in the adoption of E-office in Pakistan, FC played a dominant role. The government provided all necessary technical and organizational infrastructures like IT equipment, knowledge, skills, training, and technical assistance to public officials that influenced their decision to actually use E-office. Historically, lack of FC were among the main reasons that E-office could not be adopted across all FG organizations. The government started the project but was unable to created necessary conditions in terms of budgetary commitments and technical and organizational infra-structure which is why the officials were unable to adopt the system. At the same time, it is equally important to note that only FC do

not guarantee technology adoption rather they work in combination with other external and internal factors.

The results of the analysis reveal that public officials' decision to use E-office was also related to influence of government of Pakistan, heads of organizations and important others like friends, colleagues, etc. In fact, EI worked in combination with FC and jointly impacted the decision of the officials to use E-office system. Especially, as a kick starter of the process, the role of the government and organizational heads was crucial. Historically, non-adoption of the system was due to weak influence of the government and organizational heads on public officials.

Among the internal or personal factors, HM and EE were important for adoption of the system in the FG by public officials. Among the other reasons for automation of filing system in the government, ease and reduced efforts associated with information transfer and record management were significant ones. The sole purpose was to substitute the manual filing process with easier and aesthetically attractive system that could generate interest and provide pleasure to users. In fact, public officials' BI to use E-office and their AU of E-office were also related to these two factors, i.e. HM and EE.

5.2. Policy Recommendations

In public sector in Pakistan, mandatory settings and external influence appeared to influence public officials to use E-office. External influence in the form of policy or

policy guidelines is exerted at the government level by political government and implemented at institutional level by organizational heads. For full implementation of six modules of E-office project, external influence at the government and organizational level will certainly play an important role.

Future integration of ICT in the public sector organizations warrants placement of tech-savvy and tech-friendly leadership as heads of the organization. Such leadership will not only find means and ways to create FC for workers to adopt technology in their organizations but also serve as role model for other government officials. For sustainability of the policy, they need political and organizational oversight and regular monitoring.

Lack of institutionalization of innovation often results in implementation failure because employees, as the main stakeholders, limit the usage of technology which is initially thrust upon them. Therefore, not only external influence but also training, awareness and reward system to government officials will boost their morale to voluntarily adopt and sustainably use the technology for official work.

The personal and individual aspects of public officials require thorough consideration while formulating and implementing techno-policy in the federal as well as provincial governments. For sustained techno-friendly behavior and practice,

individual aspects of FG employees need urgent attention followed by continuous monitoring and policy intervention.

According to the report of Cabinet Committee on Implementation (CCI), in 2019-20, 95% of employees in FG were supporting staff (Grade 1-16) whereas only 5 % were officers (grade 17-22)¹⁹. Full implementation of this project and similar project in future will certainly reduce officer to staff ratio. The surplus staff can be better utilized in organizations where they are needed the most. In future the need for more support staff will decline which will result in cost saving for the government in terms of salary disbursements and pension liabilities.

E-office project evaluation by the FG will give deeper insights to rectify technical, organizational and individual issues and serve to provide guidelines for future ICT projects in the federal and provincial governments.

5.3. Recommendations for future studies

This work can serve as relevant source of information/ literature in the field of

¹⁹ <https://www.thenews.com.pk/print/824637-despite-devolution-number-of-federal-govt-employees-has-increased-cabinet-told>

technology adoption in G2G context in Pakistan. The research gives useful insight about the application of UTAUT in public sector in the FG.

In future, research on the same topic in the public sector may also involve moderators and larger sample size that would give confidence to the researcher to have deeper insight for generalization and validity of results

The scope of the research can be extended beyond FG. Similar studies involving provincial governments will enable the researchers to capture varying conditions and implications and get holistic understanding of technology adoption (G2G context) in the public sector in Pakistan.

New area of research in the field may preferably use mixed approach to investigate critical constraining factors for weak correlation of BI and AU in the public sector in FG. Such research may focus on the behavioral aspects public sector employees at individual level rather than organizational level.

5.4. Limitations

This study used UTAUT model as theoretical framework. The model contains moderators like age, gender, experience and voluntariness of use which were not used in the current research. Not using the moderators is the limitation of the study but the literature review has identified many studies that have used UTAUT model without moderators. (Alalwan et al., 2015; El-Masri & Tarhini 2017; Morosan & De Franco, 2016; Oechslein et al., 2014; Raman & Don, 2013).

The researcher, being in South Korea for major part of the study, could not collect relevant data directly. As a result, the study relied on online survey which was analyzed using pre-dominantly quantitative approach. Interviews with top government officers could not be done either.

Due to time constraint, the researcher received response rate of 52.6%. Out of 500 FG employees 263 returned the filled-in questionnaire. The need for larger sample size was felt.

This study was done by keeping the context of public sector; particularly FG in Pakistan. Hence, such research results may not generalize in the domain of private organizations in the country.

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APPENDIX

Research Information Sheet and Questionnaire

Asalam o alaikum, Dear Sir/ Madam!

This is Najeebullah Khan (OMG from 39th Common). I am currently doing Global Masters in Public Administration from Global School of Public Administration, Seoul National University, South Korea. This study attempts to study adoption of E-office by federal government (FG) employees in Pakistan

The purpose of this questionnaire is to obtain honest feedback from the FG employees on voluntary basis. *Your response on the questionnaire does not identify you in any way and is totally anonymous.* Your frank response will really play a decisive role in identification of reform areas for the FG in future.

This questionnaire will take 5 minutes at maximum. I take this opportunity to express my heartfelt gratitude for your time, energy and cooperation.

In case of any query regarding the questionnaire, feel free to contact me via email: najeebullah2021@snu.ac.kr or WhatsApp (+82-10-7421-7752)

Demographic Questions

Section 1

Gender

- ☐ Male
- ☐ Female
-

Age

- ☐ 21- 30
- ☐ 31- 40
- ☐ 41- 50
- ☐ 51- 60
- ☐ 61 and above
-

Educational Qualifications

- ☐ Intermediate (12 years) and below
- ☐ Bachelors (14 years)
- ☐ Masters (16 years)
- ☐ M.Phil. (18 years) and above
-

Work Experience

- ☐ Less than 10 years
- ☐ 10 to 20 years
- ☐ 21 to 30 years
- ☐ 31 years and Above
-

Type of Organization

- ☐ Ministry/Division
- ☐ Executive Department (Attached Department or Sub-ordinate office)
- ☐ Autonomous Body
- ☐ Constitutional Body
- ☐ Other

Official Grade

- ☐ BPS 16 (or its equivalent) and below
- ☐ BPS 17 or its equivalent
- ☐ BPS 18 or its equivalent
- ☐ BPS 19 or its equivalent
- ☐ BPS 20 (or its equivalent) and above

Job Status

- ☐ Cadre officer/official
- ☐ Ex-Cadre officer/official
- ☐ Non-Cadre officer/official
- ☐ Other

Construct Questions

Section 2

PE-Kindly select only one option per row like strongly agree, agree, neutral, disagree or strongly disagree

PE:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
PE1. By using E-office, I will be able to process more cases in less time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PE2. By using E-office, I will be able to accomplish my targets more quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PE3. If I use E-office, my dependence on the staff will reduce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PE4. If I use E-office, I would find it useful in my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

EE-Kindly select only one option per row like strongly agree, agree, neutral, disagree or strongly disagree

EE:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
EE1. If I use E-office, it will be easier for me to trace the location of files	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EE2. Learning to operate E-office is easy for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EE3. Using E-office makes the communication with-in the organization and with other government organizations easier.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EE4. It would be easy for me to become skillful at using E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

HM-Kindly select only one option per row like strongly agree, agree, neutral, disagree or strongly disagree

HM:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
HM1. I like working with E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HM2. E-office makes my work interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HM3. Working with E-office is fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HM4. Using E-office is good idea for official work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

FC-Kindly select only one option per row like strongly agree, agree, neutral, disagree or strongly disagree

FC:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
FC1. I have the necessary resources/equipment to use E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FC2. I have the necessary knowledge to operate E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FC3. I can get help from others in case of difficulties while using E-office.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FC4. I have been trained/guided on how to use E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

EI-Kindly select only one option per row like strongly agree, agree, neutral, disagree or strongly disagree

EI:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
EI1. The federal government supports the use E-office for official business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EI2. My organization supports the use of E-office for official business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EI3. The people whom I consider important (bosses, friends, colleagues), think that I should use E-office for official business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EI4. I know that other federal government organizations also use E-office for official business.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Construct Questions

Section 3

BI-Kindly select only one option per row like strongly agree, agree, neutral, disagree or strongly disagree

BI

	Strong agree	Agree	Neutral	Disagree	Strongly disagree
BI1. I intend to use E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BI2. I plan to use E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BI3. I predict that I will use E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

AU-Kindly select only one option per row like strongly agree, agree, neutral, disagree or strongly disagree

AU

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
AU1. I am active user of E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AU2. I am willing user of E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AU3. I am interested user of E-office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

국문초록

파키스탄의 E-정부 연방정부에서 E-Office 채택의 결정요인에 대한 조사

Najeebullah Khan

서울대학교 행정대학원

글로벌행정전공

1990년대 이후, 전 세계 국가들은 E-정부로 변화하고 있다. 많은 정부는 시민과 기업에 서비스를 제공하고 정부 조직 내에서 정보를 교환하기 위해 다양한 형태의 기술을 채택했다. 기술의 채택은 전 세계 정부의 업무와 과정에 큰 변화를 가져왔다. 독립 이후 파키스탄 연방정부(FG)의 공식 업무는 승인, 제안 및 정책 수립에 사용되는 수기 메모와 함께 수동 파일 시스템을 통해 일상적으로 수행되어 왔다. 수동 파일 시스템을 대체하기 위해, 정부는 연방 부처와 제휴 기관에 걸친 E-office 애플리케이션 제품군을 출시했다.

본 연구는 공무원들이 E-office를 공식 업무에 도입하는 데 영향을 준 요인을 조사하였다. 이 연구의 이론적 프레임워크는 정보 시스템(IS) 분야에서 자주 사용되는 모델 중 하나인 통합 정보 기술 채택 및 사용 이론(UTAUT)이었다. 조사 방법을 사용하여 공무원으로부터 263개의 입력된 온라인 설문지를 받아 구조 방정식 모델링(SEM)으로 분석하였다. 결과에 따르면 쾌락적 동기(HM), 촉진적 조건(FC), 외부 영향(EI)은 공무원이 E-office를 사용하는 데 상당한 영향을 미쳤고, 노력 기대(EE)는 행동 의도(BI) 및 실제 사용

(AU) 측면에서 영향을 미쳤다.

파키스탄의 FG는 지속적인 모니터링과 기술에 정통한 임원들의 조직 책임자로의 포스팅을 통해 정부의 영향력을 유지하기 위해 E-office 애플리케이션 스위트의 모든 모듈을 운영함으로써 프로젝트를 구현해야 한다. 이는 공무원의 성과기대(PE)를 높이고, E-Office의 BI 및 AU에 긍정적인 영향을 미치며, 인력에 대한 의존도를 감소시키는 결과를 가져올 것이다. FC와 EI와 같은 외부 요인은 파키스탄의 공공 환경에서 잘 작동한다. 그럼에도 불구하고, 공무원의 개인적 측면은 미래의 주 정부뿐만 아니라 연방 정부에서도 기술 정책을 수립하고 시행하면서 철저한 고려가 필요하다. 법률 도구와 데이터 분석 도구의 디지털 개요를 통합하여 응용 프로그램을 더욱 개선할 수 있다.

주요 키워드: E-정부, E-office 채택, UTAUT, 파키스탄, 연방정부, SEM, 결정 요인