



Universiteit Leiden

ICT in Business and the Public Sector

**Combating Corruption through ICT enabled
Governance. A case study for Pakistan**
Analyzing Barriers and Drivers for e-governance adoption in Pakistan

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MASTER'S THESIS

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Abstract:

This thesis puts Pakistan under the spotlight and assesses its ability to combat corruption through ICT-enabled solutions in its governing system. Corruption is deeply rooted in Pakistan's governance system and across public organizations, which hinders the path to sustainable development. Starting with the idea of governance and the importance of good governance in the sustainable development of a country, we will delve into the concept of corruption. With the aim of understanding Pakistan's fight against corruption, this thesis explores different aspects of corruption in Pakistan, solutions implemented by the government to reduce corruption, and its impact on society and sustainable development. Moving forward, the literature review explores e-governance as a tool against corruption. The analysis part explores the drivers and barriers to e-governance adoption in Pakistan that require immediate attention. It concludes that ICT-enabled solutions must be implemented in Pakistan's governance system, creating an e-governance system to combat corruption. This thesis contributes to the information communication systems discipline by providing insight into Pakistan's fight against corruption using e-governance and drivers and barriers to the e-governance adoption challenge in Pakistan.

Chapter 1

Introduction

1.1. Background

Governance plays a significant role in enabling sustainable development in societies. Governance at all levels is critical to the realization of the goals of sustainable development (United Nations, 2018). Güney (2017) describes sustainable development as the current use of resources with minimal harm to the future use of resources. Jordan (2008) describes sustainable development as a constant process of redefinition and interpretation. To steer development on a sustainable path, governance is a crucial and indispensable tool. (van Zeijl-Rozema et al., 2008). According to Meadowcroft (2007), the relationship between governance and sustainability arises when we aim to achieve a sustainable future by implementing policies that involve complex state-society interactions. “Governance is capable of common sense and the versatile planning required for sustainable development” (Güney, 2017). Research also claims that countries should increase their governance levels to prevent resources from becoming scarce (Güney, 2017). Governance proposes the concept of accountability and responsibility in making policies and decisions that affect citizens and have social and economic outcomes for all (Sabani, Farah, & Dewi, 2019). According to different authors such as Van der Ploeg (2011) and Aidt (2010), poor and insufficient governance causes resource depletion in society, while good governance helps to boost performance in a country, pave a path to sustainable development by proper allocation of resources (Sato, Samreth, & Sasaki, 2018). According to Aidt (2010), quality institutions play a crucial role in sustainable development as they require the governance and management of resources. Governance for development consists of economic and political governance, accountability, a pro-poor policy framework, transparency, access, participation, and the facilitation of service availability (UNDESA, UNDP, UNESCO, 2012). Estevez and Janowski (2013) state the link between development and economic or political governance via good governance, public administration, civil services reforms, delivery of services, and decentralization. Governance is central to any development effort, and good governance is essential in achieving any form of development (Estevez & Janowski, 2013).

Advances in information and communication technologies (ICT) significantly reshape traditional governance into a new paradigm. The government's use of ICT has paved the path to sustainable development by facilitating public services, integrated policies, and transparency (United Nations, 2018).

Literature extensively talks about how e-governance plays a vital role in the sustainable development of societies because of its several benefits, such as a tool against corruption. The addition of information and communication technologies in the governance mechanism ensures an advanced and superior level of governance known as e-governance (Bedi, 2001). It can provide efficiency, increased service transparency, and excellent citizen participation in decision-making (European Commission, 2024). In addition, the literature suggests that ICT enables solutions to assist the transfer and sharing of information, resulting in a self-regulated communication network for governance (Meso, Datta, & Mbarika, 2005). Simultaneously, complex networks of integrated systems help diverse communities communicate and participate in sustainable development and related decisions beyond the unilateral control of single stakeholders (Meso et al., 2005).

1.2. Case selection

Developing countries like Pakistan can benefit from the rapid development of ICT in governance because of the following reasons:

- Developing economic position in the region
- High level of Corruption in Pakistan's governing system
- The study places e-governance in Pakistan within core information systems governance research.

Therefore, in this thesis, we will put Pakistan in the spotlight to understand its ability to maintain sustainable development and eradicate corruption in its governing system through e-government adoption. In Pakistan, corruption is considered one of the most severe problems in the country (Chêne, 2008, Ali, Khan & Khalid, 2016). Pakistan faces several corruption-related issues in its governing system, affecting its sustainable development. There are several corruption challenges faced by the government of Pakistan in the form of bribery, embezzlement, extortion, favoritism, fraud and nepotism (Hussain & Riaz, 2015). Pakistan's deteriorating economic situation and geopolitical significance make corruption a crucial study area for sustainable development.

1.3. Research gap

In the case of Pakistan, previous studies on corruption primarily focused on the political, legal, and social solutions to combat corruption, overlooking the role of technology in the fight against corruption. Government commitment to invest in ICT projects in the governance system can be seen in past projects such as the COVID-19 vaccination system. In their studies, Qureshi et al. (2017) have analyzed the significance of e-governance initiatives such as the National Portal, e-procurement system and citizen feedback monitoring system. The study found that these systems have improved transparency, service delivery, and accountability in the government processes. In addition, several challenges to e-governance implementation, such as lack of infrastructure, insufficient investment, and limited awareness, were found in the study. Similarly, recent studies by Nishat (2022) and Atique et al. (2024) highlighted the drivers and barriers to e-governance adoption in Pakistan. Yet, studying which drivers and barriers hold greater significance and require immediate attention is essential. This thesis is an opportunity to research and understand e-governance as a tool against corruption in Pakistan and how e-governance can play a part in combatting corruption in the country. By studying corruption as an important topic, the finding of this thesis will contribute to e-governance adoption factors that hold urgent attention to combat corruption.

1.4. Research Question

In the research part of this thesis, we will try to answer the following questions:

R1: What barriers and drivers are related to e-governance adoption in Pakistan to combat corruption?

R2: Which driver and barrier require immediate attention?

1.5. Thesis outline:

Starting with the governance landscape in Pakistan, this thesis delves into the idea of corruption and highlights corruption as a significant challenge to Pakistan's sustainable development. We will discuss the e-governance initiatives the Government of Pakistan took to fight corruption. The literature review will investigate e-governance as a strategic tool against corruption, exploring its potential applications and effectiveness. The research methodology and theoretical framework will be presented in the preceding chapters, followed by results and conclusion.

Chapter 2

Case of Pakistan

2.1. Governance in Pakistan

Pakistan has an estimated population of over 247 million, and it ranks 4th in the world by population. If the statistics are observed, the number of internet users are now above 25.62 million. The table below summarizes the information about Pakistan:

Table 1 Pakistan Summary Information

Government	Federal Government
Political System	Parliamentary Democracy (GlobalEDGE, 2024)
Language	Urdu
Currency	Pakistani Rupee
Land Size	796,100 km ² (World Data, 2024)
Population	252.7M Approx. (United States Census Bureau, 2024)
GDP	1,505.01 USD (Trading Economics, 2024)
Internet Penetration	25.62% in 2023 (Statista, 2024)
Mobile User	191.8M (Statista, 2024)

2.2. Corruption

Before exploring corruption and its impact on sustainable development in Pakistan, it is essential to understand what corruption is. According to the literature, the widely used definition of corruption is “the abuse of public power for private or personal benefits or gains” (Haarhuis & Leeuw, 2004).

According to Andvig, Fjeldstad, Amundsen, Sissener, and Soreide (2001), bribery, fraud, embezzlement, and extortion are some of the major forms of corruption.

According to Lambsdorff (2004), corruption can be classified as grand corruption or petty corruption. Grand corruption is related to getting export/import permits illegally or by offering money in return, annual tax payments, getting or offering public contracts in return for incentives, loan applications, and judicial decisions. On the other hand, petty corruption is the

misuse of power by mid—or low-level public officials in order to provide basic services to citizens in public places such as hospitals, police stations, and educational institutions (Hussain & Riaz, 2012).

2.3. Corruption in Pakistan

Pakistan is among the other developing countries with a massive corruption index as shown by international organizations in the last few years. This is evident from Pakistan’s standing in the corruption index by Transparency International. According to Transparency International, in 2023, Pakistan ranked 133 in the Corruption Perception Index (CPI) with a score of 29/100 (*2023 Corruption Perceptions Index - explore Pakistan's results*). The data of CPI for Pakistan (Figure 1) shows that Pakistan has not made any significant progress in combating corruption.

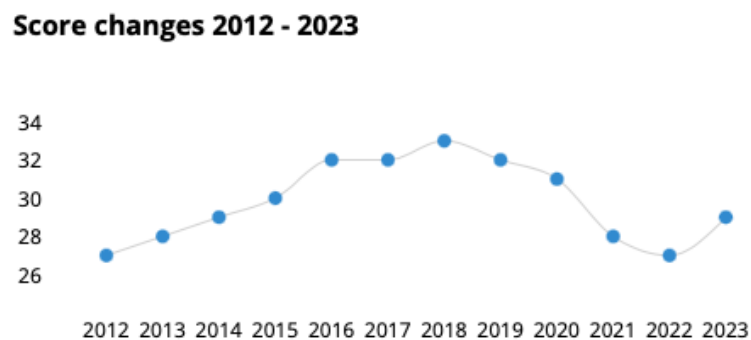


Figure 1 - Corruption Perception Index, Pakistan

Source: www.transparency.org/en/cpi/2023/index/pak

According to the Anti-Corruption Resource Centre, police and law enforcement, the power sector, legal practitioners and courts, tax and customs, health and education, and administration of land (purchase and buy) are the most affected in Pakistan by corruption (Hakobyan, 2004). These sectors are affected by not only petty corruption but also middle and grand corruption. Bribing the public officer to get something done is a common practice. According to the research, it is observed that about 82% of government employees came across the misconduct of corrupt officials in the last year but more than 90% of them didn’t even report the activities of corruption taking place(Hakobyan, 2004). Due to the need

for more accountability and transparency in Pakistan's public sector, another serious issue is the lack of appropriate allocation of resources, to protect the interest of the elites and influential people the public funds are distorted (Chêne, 2008).

Corruption is considered a systematic and widespread problem in Pakistan. World Bank's Worldwide Governance Index shows that Pakistan has yet to show much progress in combating corruption over the years (Chêne, 2008). According to Enterprise Survey, corruption by public officials in Pakistan is a significant financial burden limiting the convenience of conducting fair business in Pakistan (Enterprise Surveys, 2022). It undermines the efficiency of businesses operating in the country and increases their financial risks. Hence, this affects the sustainable development of Pakistan (Enterprise Surveys, 2022). As per the World Bank, the most significant obstacle in Pakistani society's financial and social development is corruption. It weakens the institutions' foundation and the rule of law in the country. Poor people are the most affected part of society; they are hardest hit by economic decline and are least capable of paying bribes, money related to fraud, and inappropriate allocation of economic privileges.

2.4. Impact of corruption on sustainable development In Pakistan

Corruption in the governance system affects the class of a society that is poor and has no means to exercise influence, it even leads to unequal distribution of income as well as a lack of spending on public development (Anwar & Bilquees, 2003). Corruption is affecting millions of lives in Pakistan. "In 2022, 19% of Pakistanis said that their living standards were improving while 48% said they were getting worse" (Gallup, 2022). Qadir (2003) defines *corruption* as one of the three governance crises in Pakistan. Poor economic performance is backed by high growth rate volatility and corruption in all public or private sectors. A growth rate of 2.6% has been registered in the last eight years (Abdul Farooq et al., 2013). According to Choudhry (2013), unchecked corruption in Pakistan has a significantly negative impact on foreign direct investment, also the institutions are questioned for their reliability. Glencorse and Yaseen (2022) also explain that corruption in government projects, fund allocation, and spending of public funds impacts climate disasters. The loss estimation shows that every day, more than Rs. 12 billion are lost due to corruption, this even includes tax evasion of Rs. 7 billion (Choudhry, 2013). As per the World Bank, the biggest obstacle in the growth of investment climate is corruption, it is mostly associated with the interface of business and government. Moreover, it also leads to impact decision making negatively and weakens the growth of the

economy by deterring investment (Nizam, 2023). Due to the corruption in the governing system, Pakistan is facing severe financial dependency on developed countries followed by World Bank and IMF. A recent survey conducted by the World Economic Forum reports that corruption is one of the most critical factors for business in Pakistan (World Economic Forum, 2017). Sala-i-Martin and Michael (2008) identify that when problems encountered in doing business in Pakistan are listed, corruption appears to be the top third, first and second being poor infrastructure and bureaucracy. Gohar (2012) analyzed the impact corruption may have on FDI and it was observed that they have a negative impact. Hence it is shown through studies that due to corruption a lot of uncertainty tends to be associated with investment opportunities. The study also showed that corruption discourages Multinational Companies from investing in the region (Khan et al., 2018). According to Ahmed (2011), Pakistan's fight against poverty relies on completing its development projects, which is possible by controlling corruption practices. The social impacts of corruption include problems like poor living standards, lack of employment, and inferior healthcare and education systems in Pakistan (Khan et al., 2018). According to the results of studies conducted by Farooq, Shabbaz, Arouri, and Teulon (2013) on the data prevailing in the years between 1987 to 2009, corruption has very badly impacted the economic growth in Pakistan.

Currently, Pakistan is seeking 1.1 billion USD in a bailout package from the International Monetary Funds (IMF) to improve its balance of payments (*Pakistan: IMF Reaches Staff-Level Agreement on the Second and Final Review of the 9-Month Stand-By Arrangement*, 2024). In addition, Pakistan has an outstanding loan of 5660.13 million SDR (*Pakistan and the IMF*, 2019). REUTERS reported in Feb 2024 that Pakistan's debt-to-GDP ratio has already exceeded 70% and 50 to 60% of the government's revenue will be soaked up by its debt payments this year (Jones & Shahid, 2024). Inflation is sky-high, with an increase of 10,4% from 2021 to 2022 (*World Bank Open Data*, 2024).

2.5. Different ICT solutions implemented in Pakistan to reduce corruption

Punjab Information Technology Board (PITB) works under the Ministry of IT in the province of Punjab. The board looks after ICT projects in the province of Punjab and has delivered 270 projects of ICT in the past six years. These projects include digital land records, computerizing all police stations in the Punjab province, a school monitoring system, e-Vaccs (smartphone-based applications to track vaccinators), and e-stamping. These projects aim to provide citizens with services and digitalize all paper-based government records (provincial

government) to reduce corruption. The school monitoring system aims to overcome the problem of ghost schools in rural areas and address the problem of teacher absenteeism. E-Vaccs raises geographical coverage to track vaccinators from 22% to 92% (State Bank of Pakistan, 2018, p. 100). Digitalization of land records in the province of Punjab has reduced the intervention of any public officer involved in transferring property from one person to another.

PITB has equipped the National Highway and Motorway police with smart devices incorporated with e-tracking apps. This initiative aims to provide e-ticketing services to reduce financial corruption in the highway police. The E-ticketing app interlinked all the devices and connected them to the Punjab Information Technology Board's server. With this app, commuters can receive the fine they pay on the spot or later in the bank on their mobile phones. Another initiative is the electronic procurement system for the province of Punjab. Such an initiative aims to automate and standardize the end-to-end procurement process for the government of Punjab. The aim is to make the procurement process less costly, transparent, efficient, and corruption-free.

The Citizen Feedback Monitoring Program (CFMP) is a step of the Punjab government to collect feedback from the citizens who use public services. This program aims to get citizens' feedback about their experience with public service delivery. The feedback system aims to analyze and identify corruption-related issues. Using the feedback, the government of Punjab wants to eliminate the Petty corruption in the service delivery. CFMP uses evidence-based scenarios to help citizens identify trends and patterns in service delivery. To take feedback from a citizen, the CFMP gets in touch with the citizens who have undertaken public services that fall under the CFMP and are monitored with the help of robotic calls and SMS (PITB, 2015).

In the same way, in the province of Khayber Phaktunkha, the recruitment portal of the KP government is also an example that facilitates the online recruitment of relevant employees. The purpose of this portal is to provide access and transparency to the government's recruitment process. In addition, the KP government has started providing telehealth facilities with its E-Ilaj (e-Health) services. This program aims to provide low-cost health services in rural areas (State Bank of Pakistan, 2018, p. 100).

In collaboration with the World Bank, the province of Sindh is facilitating farmers with an Interactive voice response (IVR) system, which allows them to place, track, and view their orders. Farmers can buy agricultural machinery, equipment, and seeds through this system.

This project aims to facilitate the farmers and get transparency on the payments to reduce corruption on the government side.

The government of Pakistan, at the level of federal stake, has proposed a centralized Web-based application to promote transparency at National Fertilizer Marketing Limited stores across the country. This initiative aims to develop real-time data visibility for all fertilizer stores nationwide. Financial management software will help the government monitor any financial discrepancies in fertilizer purchase and distribution throughout the country.

The Government of Pakistan has also created a water resource monitoring and management information system that helps reduce water-related corruption. This system aims to monitor the real-time water flow using geo-tagging and GPS. The real-time monitoring of water using the program will ensure water distribution between different provinces in Pakistan. The irrigation department also uses an Android app to raise awareness among farmers about their rights in water fostering and theft.

Chapter 3

Literature Review

3.1. E-Governance as a tool against corruption

The literature on ICT and its benefits and applications in combating corruption is extensive. This section will explore the literature and review e-governance as a tool against corruption by looking at past literature. Different research in ICT and corruption defines *e-governance* as a strategy that helps in controlling and restricting corruption. Different countries in Asia are using e-governance to limit corruption. These countries include Hong Kong, Korea, and Singapore. The technological innovations have intervened against corruption and based on their suitability for the local requirements, have catered to various cultural backgrounds (Tangkitvanich, 2003). The publications of the information by the government present on the web help the citizens to make the most of accountability and provide them with relevant documents that help them initiate their complaints against the practices of corruption (Bhatnagar, 2003). Colby (2001) and Millard (2004) also discussed in their research that ICT offers several benefits to combat corruption when compared to the management systems that prevail conventionally. It offers immediate communication, automated record generation, wide research, and better access, followed by recovery and classification of data systematically (Millard, 2004). These aspects may lead to shaping the relations between the citizens and the government by transforming the administration of the public (Colby, 2001). The evolution of

ICT has led to the derivation of innovations which helps deal with corruption in the best possible way (Mahmood, 2004). Those who are responsible to decide on any matter of public may be identified easily and hence the transparency is achieved (Bassanini (2003).

In addition, the power of e-governance is the biggest deterrent to corruption, and hence, it helps to improve over-accountability with a high impact on poverty Cisar (2003). Cho and Choi (2004) demonstrate the fact that e-governance has helped to reduce corruption and has improved transparency and accountability when it comes to delivering public services. Kossow and Kukutschka (2017) also considered making the public services move toward digitalization so that the corruption opportunities may reduce. Moreover, the role of ICT tools has also supported the activities of civil society by allowing the public to participate. The tools offered by e-government also help to reduce the waiting time and the availability of public services through the day; in most cases, it also helps in reducing the cost by offering remote services (Ndou, 2004). These methodologies have also led to implement an anti-corruption process which leads to reduce the contact between the public officials and citizens that gives rise to corruption. Citizens have the liberty to submit and file petitions and also make the use of online services using their own personal devices or the terminals setup in the e-government offices. This is an attempt to reduce favoritism leading to corruption in the public sector (Shim & Eom, 2008; Andersen, 2009; El-Bahnasawy, 2014). One of the case studies by Aduwo et al. (2020) and Neupane et al. (2014) suggests that with the help of e-procurement systems the data related to the bidding process of government contracts is visible and hence no bidder can get any favor in return of financial benefits.

The literature review shows the implementations of ICT solutions in governance to combat corruption in the following six main categories:

- Digital public services
- Crowdsourcing platforms
- Whistleblowing platforms
- Transparency platforms
- News reporting and dissemination platforms
- DLT and block chain technology

Research shows that corruption is usually supported by power, lack of accountability, and bribes in the public sector; all this can be controlled by implementing transparent legal systems in these public departments (Mistry, 2012). These studies agree that by importing the e-government systems that lead to corruption may be reduced and hence the power exercised

by the officials is also deterred leading to a better administration in public sectors (Kim, 2007; Mistry, 2012). The mentioned authors, in principle, agree that the role played in the anti-corruption strategies of e-government cannot be ignored as it leads to better initiatives and also results in better transparency. It helps in limiting the possibility of public officials taking bribes, and it delays the use of ICT, which has helped reduce corruption in most countries. The advantages of e-government in reducing corruption is confirmed using regression and correlation analysis.

E-government can limit the activities of corrupt officials, delay a process, and earn bribes from them as the system offers complete tracking and provides faster service (Khan et al., 2021).

3.2. ICT enabled solutions as anti-corruption tool | Counter argument

ICT offers to be an instrument for deterring corruption, and we cannot ignore the possibility of these tools being used in favor of corruption as well. While a substantial body of literature shows promising results about the effectiveness of e-governance, alternative viewpoints underline the necessity of considering supplementary factors while using e-governance to combat corruption. These supplementary factors include simplification and standardization of the processes for public service delivery, accountability practices, citizen participation, and public trust (Khan et al., 2021).

The comprehensive analysis of the literature shows an ongoing debate acknowledging both proponents and critics about the utilities of e-governance in the context of corruption reduction. Research broadly aligns with the belief that e-governance is efficacious in economically developed countries. ICT solutions under the umbrella of e-governance must be designed while understanding the underlying problem that produces the opportunity for corruption. In many cases, ICT initiatives open a new path of financial corruption. Past research gave insight into use case consideration, implementation, advantages, and disadvantages of anti-corruption tools. For example, crowdfunding platforms rely on extensive follow-up mechanisms as anti-corruption tools for their best efficiency. Implementing ICT solutions as an anti-corruption tool must consider prevention strategy, enforcement strategy, citizen participation, and capability building (Khan et al., 2021). The involvement of extensive procedures and ambiguous rules in the provision of public services can create a new opportunity for corruption (Zhao & Xu, 2015). E-government can reduce the chance of

uncertainty, and it is done by simplifying and publishing the policies, guidelines, rules, and procedures based on the perspective of TCE; it results in reducing corruption due to prevention in chances of corruption (Ojha & Palvia, 2012; Prasad & Shivarajan, 2015). Regarding prevention strategy, Shim and Eom (2009) define the ICT systems as a tool to reduce personal contact between stakeholders. One example is the OPEN (Online Procedures Enhancement for Civil Application) case in South Korea, which limits the risk of corruption by eliminating human involvement (Kim et al., 2009).

Regarding enforcement strategies, research suggests that the government's commitment to combat corruption depends upon how accountable and transparent public servants are. Different Studies (Kim, 2014; Krishnan et al., 2013; Kumar et al., 2018) perceived e-government as a promising tool for combating corruption. The argument presented in these studies shows that e-governance is a tool for transparent information sharing regarding government initiatives, access procedures, rules, and governing public services. According to these studies, the visibility of actions, decisions made by government bodies, performance indicators, and the results of decisions made by the government are possible through ICT solutions (Kim, 2014; Krishnan et al., 2013; Kumar et al., 2018). These studies consider ICT to be a facilitator of transparency and a means of reducing corruption.

Research also considers citizen participation as another facilitator to ICT solutions in reducing corruption. The research by Zheng (2016) acknowledges the importance of citizen participation as an effective way to control corruption. Citizen participation includes empowering citizens to share their decisions, experiences, and opinions (Denhardt & Denhardt, 2000). Traditional methods of citizen participation are considered costly, time-consuming, and require massive effort. These reasons lead to disinterest in citizens and an increase in the workload of public employees. The e-participation framework tends to play a vital role in dealing with such issues. (Khan et al., 2021) argued that the coordination cost decreases when ICTs are used. If it is expected from citizens they tend to participate and even demand government information, which leads to an increase in the transparency and openness in the initiatives taken by the government. Shim and Eom (2008) also believe that with ICT solutions, citizens can systematically report their experiences of corruption and also play a role in the control of corruption (Kim et al., 2009). Zheng (2016) believes that increased citizen participation can decentralize the government's authority and deter corruption in the long run. The study by Kim (2014) indicated that e-government offers more success in containing corruption during the availability of experienced and reliable public agents and high-quality public bureaucracy's values. Žuffová (2020) explains the significant role played by internet

and press freedom which impacts the relationship between the level of corruption and policies of transparency.

The literature overview clearly shows that ICT is a tool against corruption, but that is not all. Simplifying business processes in service delivery, reducing human contact, and increasing citizen participation are essential in combating corruption and policy implementation. In the same way, follow-up mechanisms in crowdfunding projects are the backbone of success.

Chapter 4

Method

4.1. Theoretical Framework

The theoretical framework of this research is based on the conceptual model of the e-government adoption challenge to overcome corruption in Indonesia by Sabani, Farah, and Dewi (2019). The study outlines the pre-existing conditional variables that hinder e-governance adoption in developing countries (Table 2). These are unique situational characteristics in developing countries regarding governance (Sabani et al., 2019). According to this research, these pre-existing conditions can be divided into four categories: Governance, ICT infrastructure, Human resources, and Environment.

Table 2- Pre-existing situational characteristics

	Pre- existing conditional variables in developing countries	Refrence
Governance	Weak Institutions Low Transparency Low Accountability Low control of corruption Poor Regulatory Quality	Ciborra, C.U. (2009) Dawes, S.S. (2008) Farah, M., & Sabani, A. (2019) Güney, T. (2017) Jessop, B. (1998) Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010)
ICT Infrastructure	Poor infrastructure is centralized Lower level of internet accessibility Higher level of digital divide	Al-Soud, A., Al-Yaseen, H., & Al-Jaghoub, S. (2014) Elbahnasawy, N. G. (2014) Krishnan, S., & Teo, T. S. H. (2012) Sabani, A., Deng, H., & Thai, V. (2019) United Nations (2018) Republik Indonesia (2014)
Human Resources	Lack of competent personnel Lower level of awareness Lack of professional training	Kristiansen, S., et al. (2009) Furuholt, B., & Wahid, F. (2008) Alfred Tat-Kei, H., & Anna Ya, N. (2004) Sabani, A., Deng, H., & Thai, V. (2019) Waseda University. (2017)

Environment	Emerging economies Lower standard of living Lower level of transparency Limited development budget Higher level of corruption	Napitupulu, D., et al. (2018) Mirchandani, D., Johnson Jr, J., & Joshi, K. (2008) Sabani, A., Deng, H., & Thai, V. (2018) United Nations (2018) World Bank (2018)
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According to the study, these pre-existing conditions in governance cause bad infrastructure, lack of human resources and lack of understanding between different stakeholders (Sabani et al., 2019). For example, research argues that in developing countries like Pakistan, governance is often questioned for its institutions being weak, equipped with a lack of control and transparency for corruption and low accountability (Sabani et al., 2019). Research claims that these challenges in governance come from several challenges in the infrastructure of ICT, overall environment and human resources. In the case of developing countries, the ICT infrastructure needs to be developed due to the de-centralization of ICT infrastructure, low internet availability, and a more significant digital divide. Moreover, the need for more human resources also poses a significant challenge in developing ICT infrastructure. Lack of professional training among the staff and a lower level of awareness among the public about new technology causes adoption challenges (Sabani et al., 2019). In addition, pre-existing environmental conditions, such as low development budgets and high levels of corruption, further delay the development process (Sabani et al., 2019).

The pre-existing situational characteristics mentioned in the research by Sabani et al. (2019) are particular to developing countries. Pakistan is a developing country facing governance challenges in the form of weak institutions, low transparency, low accountability, and low control of corruption, which has been discussed in this thesis. Based on these preexisting conditional variables (Table 2), the research further describes the critical factors in the form of drivers (factors that support e-governance adoption) and barriers (that hinder e-governance adoption) to e-governance adoption in Indonesia (Table 3).

Using these critical factors, our thesis will determine their relevance and effect as drivers and barriers to the e-governance adoption challenge in Pakistan to combat corruption.

Table 3 Drivers and Barriers

Drivers	Barriers
Government Support	Budget Limitation
Motivation	Infrastructure Readiness

Policy Enforcement	Incompetent Staff
Transparency	Low Awareness
Trust	Low Participation
	Poor Performance
	Accessibility

In addition, further investigation of the literature provides support for these drivers and barriers. It demonstrates the relevance of these critical factors (Table 3) in the form of drivers and barriers with comprehensive research methodologies and conceptual frameworks. Different researchers point out the same critical factors as Sabani et al. (2019) that are important for the successful outcome of e-governance adoption in developing countries. For instance, research by Ziemba, Papaj, Źelazny and Jadamus-Hacura (2016), Napitupulu, Syafrullah, Rahim, Amar, and Sucahyo (2018) and Ziemba, Papaj and Źelazny (2013) describe Budget Limitation and Funding as a critical factor (barrier) in their study. Nkohkwo and Islam (2013) and Xu, Zhang and Barkhi (2010) claim that IT infrastructure is an important barrier to implementing e-governance. Adendorff and Smuts (2019), Nkohkwo and Islam (2013), and Napitupulu and Sensuse (2014) found policy formulation and policy enforcement to be drivers of e-governance implementation in countries that are in the phase of development. A study by Othman and Razali (2018) and Alathur, Ilavarasan and Gupta (2011) show that Citizen participation by empowering them with the proper knowledge plays a critical role in adopting e-governance in developing countries.

In addition, several studies present critical factors not present and discussed in the study by Sabani et al. (2019). For example, studies by Napitupulu and Sensuse (2014) describe Clear Vision and Strategy as a critical factor for e-governance adoption in developing countries. Another study proposed five critical factors for implementing e-governance, particularly for developing countries. These critical factors include strategic planning, e-leadership, communication and coordination between different stakeholders, skills and abilities and trust (Siddique, 2016). Napitupulu and Sensuse (2014) consider Collaboration among different stakeholders as a critical factor that can drive e-governance adoption in developing countries. These critical factors will help us to design our research methodology. We will analyze Pakistan's drivers and barriers to e-government adaptation based on these critical factors.

4.2. Case Limitations

The rationale for choosing these critical factors for this thesis is due to the shared context of Pakistan and Indonesia as developing nations with similar corruption problems in their governance system. Pakistan can benefit from Indonesia's experience in combating corruption through e-governance initiatives in the country's governance system. Motivated by three primary objectives: harnessing ICT for development, efficient governance, and combating bureaucratic corruption, Indonesia started its e-governance journey in 2011 and achieved its goal of rolling out e-governance on all government levels in 2018. The study by Sabani et al. (2019) is a focal point of motivation for this thesis, yet the absence of research methodology in the study poses a limitation. The absence of research methodology presents us with a challenge in understanding the roadmap to collect data, analysis process and validity of results. The limitation has been addressed by proposing a research methodology and the criteria for selecting the literature for the analysis.

4.3. Research Methodology:

The qualitative research methodology analyzes the literature focusing on e-governance adoption in Pakistan. The following are the criteria for the selection of literature:

- Reports and case studies of different international stakeholders such as the World Bank, UN, and IMF
- Literature must not be eight years old
- Credible news articles
- Literature/reports published by the government
- Citizen centric publications

Qualitative research methodology deals with non-numerical data to gain meaningful insight. Using coding and Categorizing methods, the focus will be on determining the factors that drive or cause a barrier to the implementation of e-government in Pakistan and require immediate attention. The selection criteria for the material ensure that it is recent and relevant, forming the basis for a comprehensive literature review. The drivers and barriers will be listed with quotes and used as codes.

Critical factors defined by Sabani et al. (2019) in Table 3 have been used as Predefined codes in the analysis. These codes are divided into two categories: drivers and barriers. The analysis also focused on creating new codes. These codes are the new drivers and barriers the literature presents during the analysis. Grouping codes into DriverNew and BarrierNew will

give us insight into the new drivers and barriers. Intelligent transcription methods have been used to transcribe the resources. Intelligent transcription interprets using every word but excludes statuses, pauses, and filler words.

The table below shows the selected literature for the analysis:

Table 4: Selected Literature

Name	Author/Publisher	Centric
Digitalization women in Pakistan report 2023.	Akram (2023)	Government
Pakistan National ICT Industry Whitepaper	(Ministry of Information Technology and Telecommunication, 2022)	Government
Unleashing the Potential of AI in Pakistan	(Nazir, 2023)	Citizen
E-government in Pakistan- Closing the connectivity gap	(Sear, 2021)	Citizen
The dream of e-Governance in Pakistan	(Farooq, 2021)	Citizen
Pakistan stands 153rd in E-governance	("Pakistan stands 153rd," 2021)	Citizen

Chapter 5

5.1. Results and analysis

The first step of the coding process is to get a comprehensive understanding of the text through reading. This step involves distinguishing the relevant and irrelevant parts of the literature. The process involves employing structural coding techniques that separate relevant and irrelevant sections in the literature. This approach is used as the data for analysis comprises various reports containing multiple topics. This process gave us insight into understanding the literature and finding the relevant parts specific to the research and analysis objective. For example, in the report, *Digitalization & Women in Pakistan*, the "Definition of online communication" was identified as irrelevant to analysis as the information in this heading does not contain information related to analysis. In the same way, "Basic barriers to successful adoption and use of technology by Pakistani women" is identified as the relevant part of the literature. In the same way, the "Overview of the major challenges facing women in tech" section is considered relevant for further coding.

In the next step, we keep the rules of the *vivo* coding method in mind, emphasizing the writer's actual words rather than interpreting them. In this process, we started assigning the initial predefined codes to the data. In this step, we identify and tag the lines of text that talk explicitly about the drivers and barriers in Pakistan's digitalization and e-governance adoption process. For example, predefined barrier codes "Infrastructure Readiness," "Budget Limitations" and "Low participation" have been assigned to the text segment below:

"The UN report presents a fragmented and siloed approach, lack of enabling telecommunication infrastructure and low affordability, digital skills gap, cyber security, data privacy and lack of trust, service design maturity, and limited citizen participation as factors responsible for Pakistan's ineffective digital government development."

Similarly, the predefined barrier "low awareness" is assigned to the following text segment:

"Overall, a multi-pronged approach that includes government support, private sector partnerships, community-based initiatives, and education and awareness campaigns can help increase the digital literacy, accessibility, and capacity building of women in technology."

Several text fragments offer more insight than predefined barriers and drivers that lead to creating new code in the process.

In the analysis, service effectiveness and e-education of the people emerge as the new drivers for implementing ICT-enabled governance in Pakistan. The analysis indicated that most of the government's online services could be more effective and need improvements. User-friendly web and mobile applications play an important role in ensuring that service provision is effective. Literature suggests that most service delivery websites or mobile apps must improve functionality. The emergence of E-education of the people as a new driver argues that the Government must take initiatives to increase IT literacy in people. Providing citizens with basic IT training plays a massive role in driving ICT-enabled governance in Pakistan. The purpose of such programs must be to inform people about government services and how to access these services on the Internet. Although internet penetration is very high, the knowledge of accessing these services is shallow in Pakistan. Results show that the Government must empower people with IT education to use its solutions and services. More people who can use and understand public service delivery through ICT-enabled governance will increase citizen participation and thus drive the e-governance systems in Pakistan. Policy enforcement supports the argument that implementation of ICT in governance is not enough, but effective business procedures of service delivery play an essential role in ICT-enabled governance.

In addition, the results also show the emergence of new barriers to implementing ICT-enabled solutions. One of these barriers is the digital gender divide. Pakistan has a 49.2 female population (World Bank, 2024). The participation of women in society is low, which causes a digital gender divide. The Government must support women's IT education to decrease the digital gender divide. The analysis highlights the issue of the digital gender divide due to the cultural and social structure of Pakistan. As a result, many women need more basic IT knowledge and access to IT devices. Many women are dependent on accessing online services, which results in low participation of a considerable number of the population in the country. Another new barrier indicates that many ICT-enabled solutions for service delivery are outside the National Language, Urdu. Most of these services and solutions are available in English, making them inaccessible to ordinary people with less knowledge of English. The Government must support the transformation of these apps into local languages to increase citizen participation. Results also show that low awareness of how ICT enables solutions is a significant barrier. The Government must make people aware of the services offered to citizens through advertising and campaigns. Campaigning about these projects and access to information can increase citizen participation and public trust. In addition to that, these solutions must be for everyone and not for a few.

The analysis shows a repeated occurrence of "government support" as a driver of e-governance adoption in Pakistan. Literature suggests that this support can be in the form of making more funds available for the ICT project, investing in the infrastructure to provide internet services in rural areas, and implementing a policy around it. The argument about the lack of funds government has as a barrier to implement e-governance in Pakistan has been repeatedly discussed and coded in all selected literature. It was observed during the analysis that the reason presented by the selected literature was corruption in the allocated budget and its distribution. The analysis also shows that the literature agrees that better policies around e-governance and internet adoption in the service delivery system drive e-governance adoption in Pakistan. Lack of structure in the governance system and weak policy-implementing institutions are failing to impose ICT-related policies in the country. The literature emphasizes creating and implementing effective ICT policies for adopting e-governance. The need for organizational-level policies makes the adoption of e-governance difficult.

The analysis also shows that infrastructure readiness is Pakistan's most significant barrier to implementing ICT-enabled governance. Pakistan is a developing country, and the government needs to show the motivation to enhance the infrastructure to provide online services to people in rural areas.

The tables below present the single occurrence of predefined drivers and barriers in the chosen literature and the new emerging drivers and barriers. The most discussed driver in the selected literature is the repeated occurrence of government motivation, policy enforcement, and government support. Due to the repeated occurrence, we can conclude that these factors require immediate attention for successful e-governance adoption in Pakistan. Meanwhile, service effectiveness and government improvement in the e-education of the people emerge as new drivers and have been discussed in multiple literature. In the same way, Table 5 shows the predefined barriers and new barriers and their occurrence in the literature. Several resources have discussed the lack of IT infrastructure as the barrier to e-governance adoption in Pakistan.

Table 5: Drivers to ICT Enabled Governance In Pakistan

	E-Education: DriverNew	Service Effectiveness: DriverNew	Govt. Support: DriverPreD	Motivation: DriverPreD	Policy Enforcement: DriverPreD	Transparency: DriverPreD	Trust Govt: DriverPreD
Digitalization women in Pakistan report 2023.	x		x	x	x	x	x
Pakistan National ICT Industry Whitepaper	x	x	x	x	x		
Unleashing the Potential of AI in Pakistan	x		x	x	x		x
E-government in Pakistan- Closing the connectivity gap			x	x	x	x	x
The dream of e-Governance in Pakistan	x	x	x	x			
Pakistan stands 153rd in E-governance	x				x		x

Table 5: Barriers to ICT-Enabled Governance In Pakistan

	Low Digital Literacy: BarrierNew	Language of ICT application:	Digital Gender Divide:	Digital Divide: BarrierNew	Data Privacy: BarrierNew	Budget Limitation:	Incompetent Staff :BarrierPreD	Infrastructure Readiness:	Low Awareness: BarrierPreD	Low Participation: BarrierPreD	Poor Performance: BarrierPreD
Digitalization women in Pakistan report 2023.			x			x		x	x	x	
Pakistan National ICT Industry Whitepaper								x			x
Unleashing the Potential of AI in Pakistan					x		x	x	x		
E-government in Pakistan- Closing the connectivity gap		x				x		x	x	x	

The dream of e-Governance in Pakistan	x	x		x		x			x		
Pakistan stands 153rd in E-governance			x	x	x	x	x	x	x	x	

5.2. Conclusion

This thesis aims to review the concept of governance, what role it plays in the sustainable development of a country, e-governance as a tool to defeat and fight corruption and combating corruption through e-governance in Pakistan. We reviewed the concept of corruption, its impact on sustainable development, and how e-governance can be used to fight and control corruption. The literature review helped us understand the situational characteristics of governance in the countries in the development phase. We explored and examined the critical factors for the adoption of e-governance in Pakistan.

On the contrary, we tried to analyze the corruption problem in Pakistan and how ICT-enabled governance has been used as an instrument to combat corruption in Pakistan. The thesis has also reviewed the concept of corruption and its effect on Pakistan. A literature review found the consensus in favor and against using ICT-enabled governance to combat corruption. The thesis systematically analyzed the drivers and barriers to the adoption of ICT-enabled governance in Pakistan. Some areas have yet to be fully explored. For instance, very little research is available that captures all the factors that drive or create a barrier and their significance in the successful adoption of e-governance in Pakistan.

In the same way, more research is needed to capture the right implementation of e-governance to deal with corruption in Pakistan. The government of Pakistan has implemented several ICT-enabled solutions to fight corruption, but their performance needs to be studied. Very little research focuses on and measures the performance, transparency, and effectiveness of ICT-enabled solutions in Pakistan to combat corruption. Very few studies focus on trust and transparency as critical factors for e-government adoption in Pakistan. Due to this thesis's solitary nature, the data collection scope was limited to five primary sources. This constraint restricted the in-depth analysis of literature using more sources. Due to the limited number of sources reviewed during the analysis, it constrains the generalizability of the results. Further

studies on the same topic with an extensive team can affirm the accuracy of the results presented herein.

The foundational study by Sabani et al. (2019) that inspired this thesis needed to state its research methodology. This presented a challenge in replicating and aligning the research approach. After careful research and discussions with the supervisor, this gap was addressed by choosing a research methodology. The literature supported the decision to identify a robust and appropriate research methodology that can address the problem and ensure a contribution to the existing research body.

In conclusion, ICT-enabled governance can eradicate corruption in Pakistan, an epidemic problem in the country's public organizations. Transparency and information disclosure for public decision-making are central concepts in implementing e-governance to combat corruption. Transparency of information makes the individuals accountable for the corruption. The government's will to invest in new ICT infrastructure can pave the way for e-governance adoption in Pakistan and, hence, eradicate corruption in the governance system. Government support is essential in the projects that are meant to cover the digital gender divide and focus on the e-learning of citizens. Providing online services and educating people about these services will be the key to combatting corruption in Pakistan through citizen participation and attaining sustainable development in the future.

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