ANALYZING THE STATUS OF IMPROVEMENT IN PUBLIC SERVICE DELIVERY THROUGH E-GOVERNMENT IMPLEMENTATION IN DEPARTMENT OF PASSPORT, NEPAL

Center for Research and Development
Nepal Administrative Staff College

ANALYZING THE STATUS OF IMPROVEMENT IN PUBLIC SERVICE DELIVERY THROUGH E-GOVERNMENT IMPLEMENTATION IN DEPARTMENT OF PASSPORT, NEPAL

Center for Research and Development
Nepal Administrative Staff College

Research Team
Dr. Shyan Kirat Rai
Shital Moktan Tamang

Disclaimer
This work is a product of the staff of Nepal Administrative Staff College (NASC). The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of this institutions. NASC does not guarantee the accuracy of the data included in this work.

Recommended Citation
Rai, S.K., & Moktan, S. (2021). Analyzing the Status of Improvement in Public Service Delivery through E-Government Implementation in Department Of Passport, Nepal. Lalitpur, Nepal: Nepal Administrative Staff College

Corresponding Author:
Dr. Shyan Kirat Rai: shyan.rai@nasc.org.np

ACKNOWLEDGEMENTS

We express our gratitude to the Research and Consulting Service Department (RCSD), NASC for providing opportunity to perform this research work. We are grateful to Prof. Dr. Srikrishna Shrestha, Dr. Hari Dhungana, Dr. Prakash Chandra Bhattarai, and Dr. Maki Ito Tsumagari for providing their valuable feedback and insights to improve the research work. We are also thankful to the officials from Ministry of Foreign Affairs (MoFA) who participated in the survey through the online platform due to the lockdown imposed to fight against the COVID-19 pandemic.

ABSTRACT

Passport is an essential document that is required while travelling countries other than one's own residence. People travel abroad for search of employment, higher education, immigration, or entertainment. Accordingly, the requirement for passport is obvious. In order to issue a passport, the Department of Passport (DoP) should receive the form filled by applicants with the verified and correct information. The information verification is a very sensitive and lengthy process in Nepal as it is a paper-based system initiated and done from the local level. All the information at local level is in paper-based system, as digitization of data is still on the way. The DoP has implemented online pre-enrollment system to facilitate the passport application process. The assumption is that the introduction of technology improves the service delivery.

The objective of this study is to explore the online pre-enrollment system of DoP in passport processing and understand whether its implementation has improved the public service delivery in providing passports to the targeted audience. The study uses mixed method, consisting of E-Government Maturity Models (E-GovMM) and SWOT analysis to analyze the status of existing online pre-enrollment system. For this, we performed a purposive survey to collect the views of the officials on the use of the system. The collection mechanism of data are observations, historical records, documentary, and online survey. The literature review of public service delivery and e-government systems, review of the DoP responsibilities and performance, statistical analysis of survey data has helped us understand the service provider perspective on status of public service delivery through the implementation of the system. This study showed that the maturity level of the system is in alignment with the existing status of the online pre-enrollment system, which has attained the transactional level of maturity. Despite the low level of development in telecommunication infrastructure in Nepal, the citizens participate in the use of the e-government system. Despite the low level of horizontal and vertical integration as indicated by different e-Government maturity level the online pre-enrollment system implementation in DoP has helped to improve the passport processing process.

Keywords: pre-enrollment system, e-government, public service delivery, passport processing at Department of Passport

LIST OF ABBREVIATIONS

API	Application Programming Interface
CPO	Central Passport Office
DAO	District Administration Office
DoFE	Department of Foreign Employment
DoI	Department of Immigration
DoP	Department of Passport
EGDI	E-Government Development Index
e-government	Electronic Government
E-GovMM	Electronic Government Maturity Model
EPI	Electronic Participation Index
GoN	Government of Nepal
G2B	Government to Business
G2C	Government to Citizen
G2G	Government to Government
HCI	Human Capital Index
ICAO	International Civil Aviation Organization
ICT	Information and Communication Technology
ID	Identity Documents

MoFA	Ministry of Foreign Affairs
MRP	Machine Readable Passport
NPM	New Public Management
OSI	Online Service Index
SWOT	Strength Weakness Opportunity Threats
TII	Telecommunication Infrastructure Index
UN	United Nations
UNDP	United Nations Development Program

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1

INTRODUCTION

Government of a country exists to govern the state and society and to do so the government is responsible to provide public services. Constitution as defined by Merriam Webster dictionary is *"the basic principles and laws of a nation, state, or social group that determine the powers and duties of the government and guarantee certain rights to the people in it."* Based on the national constitution the public organizations are established and operated. These organizations are set up physically to facilitate the delivery of services to the people. Government work in a bureaucratic approach to provide public services but the increase in population, political volatility, and the red-tapism has made the bureaucratic system lethargic and non-transparent (AA et al., 2015; Bongiorno et al., 2017; Yau et al., 2004). The public service delivery is a daunting task considering the population of a country and repetition of process. In addition, the process requires a number of documentations, and verification of the documents from various levels. The delay and lack of transparency in public service delivery process is one of the challenges faced by most of the public agencies (Cho, 2017; Flak & Nordheim, 2006; Inkinen & Merisalo, 2014). The use of technology can support to enhance the service delivery process where the use of Information and Communication Technology (ICT) based systems can be useful to improve the traditional service delivery process (Cho, 2017; Kurfalı et al., 2017; Warkentin et al., 2002). The use of ICT based system in service delivery is the implementation of electronic-government (e-government), where the public organizations use ICT to acquire, store, process, and share data through electronic medium within the organizations and service seekers. Nepal is still in early stage of e-government implementation despite a practice of two decades in e-government implementation (Gupta & Shakya, 2015; Maharjan & Shakya, 2015; Marasini & Shakya, 2015b). In this research work, we look into the online pre-enrollment system of Department of Passport (DoP), under Ministry of Foreign Affairs (MoFA), It is a web-based application to perform the online information processing of passport applicants. The online pre-enrollment system is an e-government system implemented in DoP that provides the data processing feature to support the passport issuing functionality of the department.

The online pre-enrollment system supports the core functionality of the department and enhance the public service delivery process. The improvement in service delivery through the implementation of e-government system depends on factors like the readiness of the people to use the developed system, the maturity of the developed e-government systems,

availability of infrastructures to access the services, and the relevancy of the system. The e-government development index of the country is helpful to understand the status of these factors of a country. The factors in-turn explains the status of e-government system implementation in a country, which provides a way to access the e-government system implementation in the country. Nepal is at the lower ranking of the index, which indicates that still there are challenges in the e-government system implementation in Nepal (Marasini & Shakya, 2015a). There is some level of improvement in the ranking in 2018 indicating improvement in the area of e-government system implementations thus supporting the public service delivery process (Silpakar, 2019; United Nations, 2018). The study explores public service delivery from the perspective of the service provider, which is the DoP of GoN in this case. The ongoing lockdown imposed due to the pandemic COVID-19 did not allow to interact with the service seekers to explore the service receivers' perspective.

1.1 Background of study

Passport is an essential document required to travel countries other than that of residence. People travel abroad in search of employment, higher education, immigration, and refreshment and the requirement of passport is obvious. GoN stopped issuing handwritten passport from 31 March 2010 for machine readable passport; the hand written passports reportedly remained valid till November 2015, and after that GoN stated issuing only machine-readable passport being a member of International Civil Aviation Organization (ICAO) (Manual Passports No Longer Valid, 2015). In order to issue a passport, people submit the filled form to DoP with the correct information. The information verification is a sensitive and lengthy process in Nepal as the process is a paper-based system done at the local level.

Nepal brought first computer in 1972 for population census but the digitization of processes started from 2001(Basyal et al., 2018; Marasini & Shakya, 2015b; Shrestha et al., 2015). Still the essential information about an individual like birth and death incident, and citizenship are yet to digitize fully, which has backfired at a time when government had to take advantage of digitized systems to provide integrated online service to citizens. The era of e-government system development and deployment has started in Nepal, with various initiatives from GoN (Marasini & Shakya, 2015b). DoP started the e-government initiatives by providing an online pre-enrollment system to the citizens. Through the system, citizens can fill all the necessary information prior going to the DoP for a passport application process with necessary documents on the chosen date to complete the application procedure. The pre-enrollment online system and digitization of forms have cut-down the application processing time, which was tedious and paper based previously.

The implementation of e-government is a technological intervention in the existing working model. Sometimes both the citizens and the government find it difficult to accept the technological intervention, which can improve the existing working process. To improve the public service delivery mechanism, analysis of the intervention mechanism is necessary to understand the impact of e-government implementation in existing government service

process (Cho, 2017; Das et al., 2017; Scholl et al., 2012). The positive impact will be an indicator of enhancing the system to higher maturity level by adding functionalities. The challenges are lessons on developing and deploying e-government systems.

The manual method of application for passport still exists in which the application can be sent manually through district headquarter office after completing the necessary process. The District Administration Office (DAO) is responsible to coordinate in passport processing either by collecting the manually filled forms or by providing the necessary verification letter for a fast-track passport system. The existence of both the manual and online-system indicates the transition phase of technology intervention in Nepal. The effect of technological intervention to provide public service is an interesting area to look into where the penetration and use of technology has not reached to an optimum level and targeted audience.

1.2 Study Area – The case of Department of Passport (DoP)

The DoP, a department under MoFA of the GoN, issues passports to Nepalese citizens and Travel Documents to legally eligible persons in accordance with the Passport Act 2024, Passport Rules 2067, Passport Directives 2067, International Civil Aviation Organization (ICAO) standard and other related government rules and regulations. The department was established on 26 January 2012 (2068/10/12 B.S.). Prior to that, Passport Section under the Protocol Division of the Ministry was assigned with the passport and travel document related functions until the establishment of Central Passport Office (CPO) on 25 May 2010 (2067/02/11 B.S). The demand for passports began to soar rapidly along with the requirement to migrate to machine readable passports, and to effectively deliver passport services to the public a separate department was deemed necessary. The need led to the establishment of DoP as a separate organization under MoFA with a "Delivery of passport related services in a timely, predictable, trustworthy, transparent and accountable manner in accordance with public interest and prevailing laws; and issuance of passport and travel documents pursuant to the specifications and standards determined by ICAO from time to time. (DoP, 2020)"

The department has setup its goals, and among them the goals where the use of technology can be crucial are listed as follows from the website of DoP (Department Of Passport : Nepal, 2020): -

- To ease the passport issuance process through optimum use of Information Technology
- To make passport issuance and distribution more systematic and predictable
- To issue e-passports/biometric passports in the long run

The department identified many functions to achieve the goals and the functions that directly link up with the use of technology, which are as follows listed from the website of DoP (Department Of Passport : Nepal, 2020):

- To issue the Machine-Readable Passport, Electronic Passport, Biometric Passport and Emergency Passports pursuant to the standard specified by the Document 9303 of ICAO,
- To distribute the passport following due process of examining the required documents,
- To receive application for travel document and issue travel document,
- To keep electronic record of issued passports and travel documents safely,
- To receive and collect electronic applications for passport.

1.3 Problem Statement

The establishment of government agencies and departments are to provide specialized services to citizens. Technology intervention is indispensable to improve the service delivery process; many developed countries have used technology to improve their government service delivery. Developing countries are following the existing trends to better use technology in the service delivery. To access the use of technology in service delivery it is necessary to find whether the technological intervention in the service delivery mechanism has been able to bring the positive changes and improvements. The online pre-enrollment system in DoP is an e-government system of MoFA to improve the passport processing service. The assumption is that the introduction of technology improves the service delivery. The study is necessary to analyze and understand whether the introduction of the online pre-enrollment system has been able to improve the passport processing to the targeted audience. The technological intervention is due to the mandatory provision put forward by ICAO to use machine-readable passports as standard travelling document. The mandatory provision came at a time where GoN was already trying to digitize public administration as a part of e-government initiatives to provide services to the citizens in an effective and efficient way. The government had compulsion of both ICAO and making public service better with the e-government interventions.

1.4 Objective of the study

The objective of the study is to explore the online pre-enrollment system of DoP in passport processing and understand whether the system implementation has been able to generate the desired effect of improving the public service delivery to the targeted audience as a part of GoN.

LITERATURE REVIEW

Public service delivery as defined by World Bank is "A public service is a service benefiting the public that is provided by the government because it is underprovided by the market. The people benefits from outputs and outcomes of the given service, not merely inputs. For instance, buildings, textbooks, teachers, assurance of pedagogical training and quality instruction, are all inputs for delivery of education service, but the public service is to yield an output of students with skills". It is the services provided by the government institutions of a country to the citizens. The government organizations have physical presence at local, provincial, and federal level in the form of municipality, provincial ministries and organizations, and central ministries and organizations to deliver the public services targeted to the members of a community living under the jurisdiction of the concerned government. The services should be accessible to the general people in an easy and simple way possible. The government employees work in the public organizations to facilitate the public service delivery process. Government is a bureaucratic structure that establishes a governance mechanism to provide public service with standard set of rules and regulations (Improving Public Service Delivery in Nepal, 2019; Sharma, Yam & Muwonge, Abdu, 2010). The rules and regulations are setup by developing policy and acts. The main aim of government is to provide the government services in an easier way, but in Nepal the service is supply driven which has not been able to bring remarkable changes in the domain of public service delivery (Bhattarai, 2017). The demand of service requirement is increasing day by day as the awareness in population and access to the service is increasing. The traditional bureaucratic structure of service delivery and the paper-based processing system of the government is responsible for increment in the time of service delivery (Giri et al., 2018). The public service delivery also involves compilation, verification, and validation of data provided by the service seeker. This is a time-consuming process in the paper-based system where the records have not been managed properly and safely. The effectiveness of public service delivery depends on the capability, resources, and motivation of the government in providing the service (World Bank, 2018). In Nepal the public service delivery happens through the combined effort of line agencies, and local bodies at the district, municipal, and village level. Hence, there is a requirement of verification of documents from various levels to get the service from the government. The process demands coordination among the government agencies working at various levels. At the present scenario and looking towards the future of service demands it is inevitable to use technology to establish the coordination

by sharing vital information among the government agencies working at various levels.

The people of Nepal have suffered the political instability and disjointed red-tapism for decades, which has created scenario where obtaining public service is not easy (Improving Public Service Delivery in Nepal, 2019). Transparency and accountability needs in service delivery, which has a lot of room for improvement in case of public administration of Nepal. The existence of better public administration and service delivery are the measures of good governance that is longed by the citizens of any country, which is only possible if the civil servants and political leadership understand the importance of transforming administrative culture by implementing cost-efficient administrative simplification and promoting e-government systems (Bhattarai, 2017; Improving Public Service Delivery in Nepal, 2019). Good governance is essential to obtain the long-term socio-economic development. Public service delivery is one of the measures of good-governance. In order to setup a good governance system e-government systems can play a crucial role where it will help the government to maintain transparency and accountability in public service delivery (Lallmahomed et al., 2017; Sharma et al., 2014; Shrestha et al., 2015). (Hood, 1991), (Pollit, 2001), (Van De Walle & Hammerschmid, 2011) and others working in the area of New Public Management (NPM) that has been practiced in the organizations for better functioning of the organization is characterized as

i) flexibility/autonomy in decision making;

ii) delivering high quality services like private sector style;

iii) considering citizens as client;

iv) performance measurement;

v) Managerial support system - more usage of ICT, human resource, training etc. From NPM concepts, treating citizens as customer, improved human resource, usage of ICT, and performance measurement are important issues to consider for better service delivery.

The management theory also promotes the use of ICTs for management of the organization and better service delivery followed by almost all of the private and public organizations of the current time.

2.1 Electronic Government (e-government)

Governance is an established mechanism through which the government provides services to citizens. The term governance is referred to as the use of economic, political and administrative power when managing a nation's affair, which includes citizen's interest articulation and the exercise of legal rights and obligations (Ajibade et al., 2017). E-government is digitzation of public administration with the help of ICTs. Digitization makes government services easily accessible to external and internal stakeholders through the online platform with the use of ICTs (Janowski et al., 2015; Layne & Lee, 2001; United Nations, 2018). E-Government is a technology-enabled public sector reformation aiming

at providing an efficient and customer-centric model of government. The government is a combined unit of various ministries and agencies, and these organizations need to work in coordination with each other to provide effective and efficient services. The e-government standards describe the digitization scenario, information sharing, and service delivery. The rapid development in the field of ICTs has influenced service delivery mechanisms. E-Government provides benefits to the stakeholders in terms of efficiency, availability, cost, and return on investment (Avgerou, 2008; Basyal & Seo, 2016; Luk, 2009; Yildiz, 2007; Zheng et al., 2013). The benefits of e-government have attracted the countries to start the e-government initiatives, by developing e-government systems to provide services to citizens. The initiation has reduced the gap of communication between the government and citizens, where the citizens can access the government services through the online platforms. The implementation of e-government systems has reduced the gap of communication as well as the time and cost associated with the service delivery mechanism (Basyal & Seo, 2016; Moatshe, 2014). The e-government systems are categorized depending on the type of service delivery through the system. The categorization is as follows and shown in Figure 1:

Government to Government (G2G)

The e-government systems that are designed to provide communication, data sharing services within the government agencies fall under this category. It is an online non-commercial communication between government organizations, departments, and authorities. The service can be used as an instrument to establish internal relationships between government agencies. A G2G system becomes an e-government backbone of the government agencies where most of the government agencies will be connected through the system for sharing of common data.

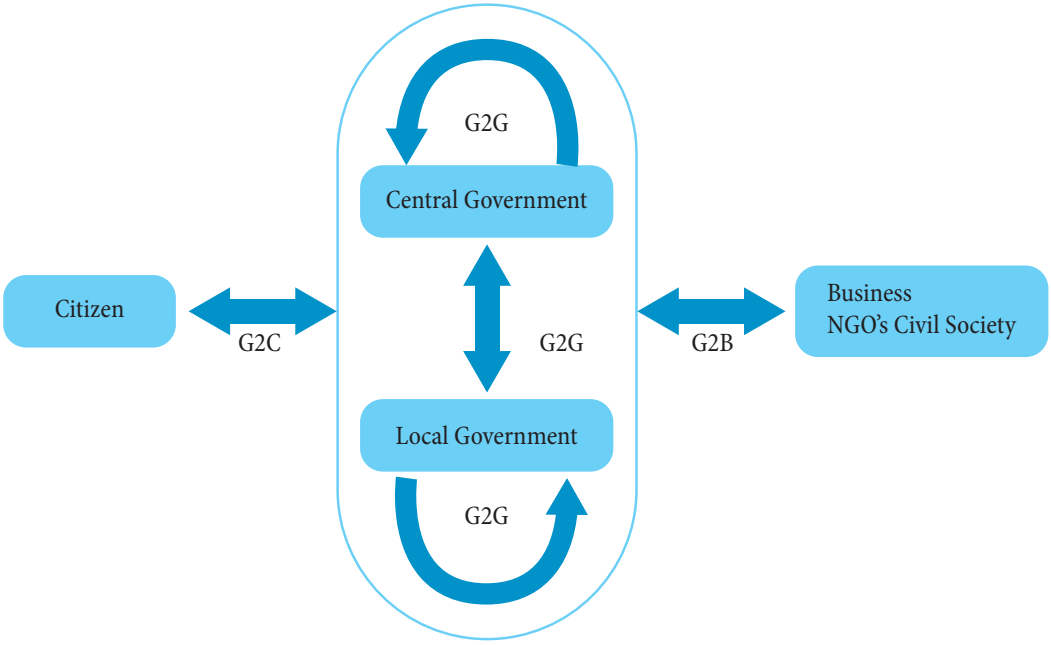
Government to Citizen (G2C)

The e-government systems that provide government services to citizens through the online platform fall under this category. It is an online non-commercial communication between the local and central governments with private individuals. The public can get services like driving license, birth/marriage/death certificate, employment applications, and passport processing from the government. Most of the services of the government are citizen-centric due to which many of the e-government development is focused on G2C systems development. Also, most of the ministries target to develop G2C services as the ministries are bound to provide services to the general public.

Government to Business (G2B)

The e-government systems that provide the services to businesses organizations through the online platform fall under this category. It is an online non-commercial communication by the government for the dissemination of policies, memos, rules, and regulations. The development and deployment of G2B services create a better business doing opportunities in the country which is suitable for the development of the economy.

Figure 1 Types of e-government and interaction between them (Source: Author interpretation of various literature)



The rapid development in the field of ICT is one of the reasons countries around the globe are practicing e-government. E-government is one of the ways to improve the existing governance system in which technology will play crucial role. The e-government implementation is possible with the availability of high-speed networks, high computing servers, and applications that keep the system up and running. The e-government makes government services instantly available through online platforms to the citizens, businesses, and other government agencies, reducing the time of service delivery (Bartoli et al., 2015; Benssam et al., 2014; Na et al., 2013; Nemoto & Hamaguchi, 2014). The advantages e-government provides over the traditional form of government has made it famous around the globe. Table 1 summarizes the benefits of an e-government system.

Table 1 Benefits of e-government (Source:(Lee & Oh, 2011a))

From	To
Paper-based government work processes.	Government work processes - automated.
Department-oriented silo procedures.	Service-oriented connected procedures.
Many government contact points and personal (face-to-face) visits government offices.	A single contact point and online access, making personal visits to government offices unnecessary.
Information management at every level of the department, and leads to duplication and redundancy among departments and agencies.	Government-wide information resource management using a common standard.

E-government reduces the gap of communication between government and citizens, and almost every government services are finding their way in an online platform. The urban areas are more networked with the ample presence of ICT services and service providers. According to the E-Government Development Index (EGDI) published by the United Nations Development Program (UNDP), the ranking of Nepal has been improved from 130 to 117 positions from 2003 to 2018 in a time span of 15 years. The values of the respective components have improved in 2018, which indicates the improvement in the situation for the implementation of the e-government in Nepal.

The value is a composite of the inherent human capital or the Human Capital Index (HCI), the status of the development of telecommunication infrastructure or the Telecommunication Infrastructure Index (TII), and the scope and quality of online services quantifies as Online Service Index (OSI). Mathematically EGDI is the weighted average of the normalized scores of HCI, TII, and OSI.

$$EGDI = \frac{1}{3}(OSInormalized + TIInormalized + HCInormalize)$$

TII

The TII is an arithmetic average composite of five indicators: (i) estimated Internet users per 100 inhabitants; (ii) number of main fixed telephone lines per 100 inhabitants; (iii) number of mobile subscribers per 100 inhabitants; (iv) number of wireless broadband subscriptions per 100 inhabitants; and (v) number of fixed broadband subscriptions per 100 inhabitants. The International Telecommunication Union is the primary source of data in each case.

HCI

The HCI consists of four components, namely: (i) adult literacy rate; (ii) the combined primary, secondary and tertiary gross enrolment ratio; (iii) expected years of schooling; and (iv) average years of schooling.

OSI

The OSI is a composite normalized score derived on the basis of an Online Service Questionnaire perfomed by 206 online UN Volunteers researchers from 89 countries covering 66 languages, assessed each country's national website in the native language, including the national portal, e-services portal and e-participation portal, as well as the websites of the related ministries of education, labour, social services, health, finance and environment, as applicable .

Table 2 EGDI data of Nepal (Data Source: (United Nations, 2018))

	2018	2016	2014	2012	2010	2008	2005	2004	2003
EDGI Value	0.4748	0.3458	0.2344	0.2664	0.2568	0.2725	0.3021	0.2807	0.2684
EDGI Rank	117	135	165	164	153	150	126	132	130
E-Participation Index (EPI)	0.7809	0.5085	0.2941	0.0263	0.0571	0.0227	0.0794	0.06556	0.1379
E-Participation Value Rank	55	89	110	134	127	152	73	75	61
Human Capital Index (HCI)	0.4957	0.4714	0.3774	0.4521	0.5821	0.5176	0.5000	0.5000	0.04800
Telecom-munication Infrastructure Index (TII)	0.2413	0.1674	0.1684	0.0597	0.0227	0.0119	0.0063	0.0063	0.0064
Online Service Index (OSI)	0.6875	0.3986	0.1575	0.2876	0.1683	0.2876	0.4000	0.3359	0.3188

The improvement in the global index indicates implementation of e-government systems in the GoN, which started in 2001 with the establishment of NITC. The ICT development project supported by the ADB provided the groundwork to develop various e-government service systems.

The E-Participation Index (EPI) is derived as a supplementary index to the United Nations E-Government Survey. It extends the dimension of the Survey by focusing on the government use of online services in providing information to its citizens or "e-information sharing", interacting with stakeholders or "e-consultation" and engaging in decision-making processes or "e-decision-making"

2.2 E-Government and Public Service Delivery

Carlson, Davis and Leach (2005) conceptualized service delivery as the relationship that exist between policy makers, service providers and the populace. As per their definition, it consist of services and its supporting systems which are generally referred to as state responsibility. These services include infrastructure, social services and services that enhance personal security. Public service delivery can be regarded as providing citizens with services of public interest. The services of public interest include: security, education, energy, water, public transport and healthcare. Fox and Meyer (1996) defines public service delivery as the provision of public goods which are tangible, and services which are intangible and the private sector cannot produce. Similarly, Riekert (2001) views service delivery as the provision of a product or service by a government body to the citizens. Due to the increase

in customers' expectations and technological revolution, public sector organizations have come under increasing pressure to deliver quality services and improve efficiency like the private sector (AA et al., 2015; Ajibade et al., 2017; Sharma et al., 2014). Citizens needs and expectations, according to (Osawe, 2015) are changing when it comes to governmental services and their quality requirements. However, service quality is a measure of how well the service level delivered matches citizens' expectations. Thus, government are saddled with the responsibilities of providing goods and services that meet the citizen's expectations. The implementation of e-government impacts the efficiency of the internal process of the government and transforms the relationship between government and society (Budding et al., 2018). E-government helps to improve public service delivery by establishing connections between government and citizens, which strengthens transparency, responsiveness, and accountability (Sodhi, 2016). E-Government has developed not only as the use of ICT in government process but as a tool to improve democracy and participation (Inkinen & Merisalo, 2014).

2.3 E-Government Maturity Model (e-Gov MM)

The e-government Maturity Model (e-Gov MM) is used to evaluate the existing e-government systems against international best practices in the area of e-government, including the formulation of organizational strategies and policies, management of ICT, operative management, and organizational capabilities of human resources and the organization overall (Almuftah et al., 2016). The maturity level of e-government indicates the amount of use and readiness of the government to support the use of technology in government activities. UN ranks the amount of improvement in the field of e-government of a country through the EGDI. The investment in the development of ICT infrastructure, education, and business environment are the major reason for the maturity of e-government (Das et al., 2017). The maturity models consider the presence of services through an electronic medium, the way of ease of communication, and the integration of functionalities within and outside the agency. The maturity models are stage models that divide the e-government into various development phases in order to understand the current status and helps to develop a roadmap for future development. (Layne & Lee, 2001) presented a four-stage model popularly used, and many of the later models have considered it as their base model. The stages defined by the model are i) Catalogue ii) Transaction iii) Vertical Integration and iv) Horizontal Integration. Using this model the online portal of DoP is tested whether each of the stages is fully complied or not in order to identify the level of e-government development.

2.3.1 Layne and Lee Maturity Model

Layne & Lee (2001) is a popular four-stage maturity model, which is the base model for many of the maturity models. The model was developed to support the chaotic and unmanageable initiatives of e-government development. The model divides an e-government development into various stages, which helps the public administrators and their respective organizations

to understand their e-government development stage and perform the required steps to develop their e-government fully. E-government is an evolutionary process, which evolves along with the development of the organization. E-government development should be based on the evolution and development of an organization. Figure 2 shows the dimensions and stages of e-government development identified by Layne and Lee. The vertical axis indicates the technical and organizational complexity that varies from simple to complex. The horizontal axis indicates the level of integration that varies from sparse to complete. The stages of e-government development are explained in terms of complexity involved and different levels of integration. The model is considered as the base model for the development of a lot of other maturity models. It helps to understand the implementation stage of e-government by comparing the currently existing condition of the e-government with the different stages defined by the model. The model shows that as the stages of e-government increase, the e-government systems develop itself from sparse to complete system, and the system that was simple at the beginning becomes complex after integration. The model is the simplest way of explaining an e-government development system, due to which it is still being used to access the maturity of an e-government system.

Catalogue is the first stage where the initial efforts are focused on cataloguing the government information and presenting it on the web. The stage is characterized by the online presence of government organizations through their websites and presenting online forms and documents. Only one-way communication is possible during this stage between government and citizens. The work accomplished in this stage increases the convenience of the citizens in getting the government information and also reduces the effort of the public servant in documentation and information dissemination.

Transaction is the second stage where the internal government systems are developed into the on-line systems and embedded into their web portals. The citizens can transact with the government electronically through the online interface as the live database will be available on-line. The stage will bring the government closer to citizens as they can transact with government in the online interface. The e-government system in this stage will reduce the processing time and physical presence of the citizens in the public offices.

Vertical Integration is the third stage, which is necessary when the citizens are very much used to with the transaction-based online systems. It refers to connection and communication among local, state, and federal governments with similar functions and jurisdictions for services from the government. The integration provides a national information base for all the organizations accessing the same information. The integration will maintain the authority of the information, which will be available at every level through proper authority.

Horizontal Integration is the fourth and the final stage, where different agencies having different functionalities are connected. In this stage, the e-government system combines across various government jurisdictions, and the systems are one-stop shops for the citizens. The systems working in this stage will integrate different databases in a variety of functional areas, and the systems are allowed to update and modify the database based on their

jurisdictions. The attainment of horizontal integration will enhance the digital performance of the e-government system, which will bring transparency in the service delivery of the government.

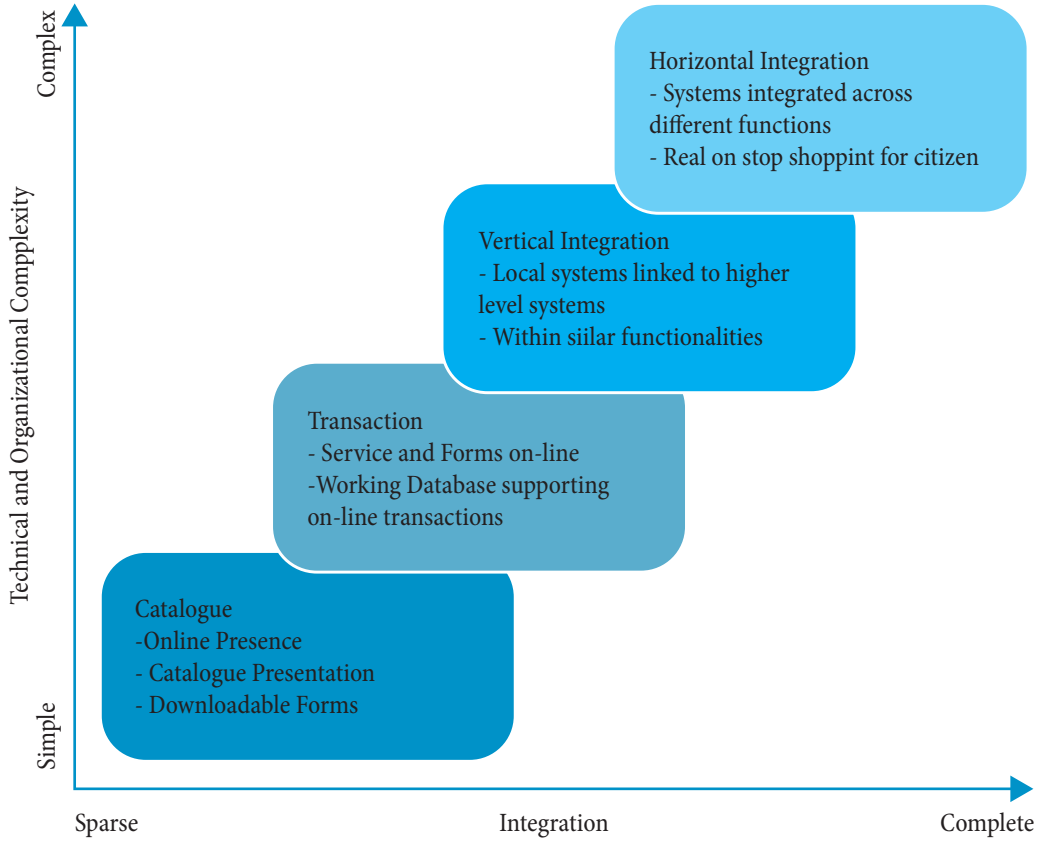


Figure 2 Dimensions and stages of e-government development as identified by Layne and Lee

2.3.2 E-Government Maturity Model for Sustainable E-Government Services

A sustainable e-government service is the ability of citizen-centric trustworthy e-government services that adopt state-of-the-art technology to deliver a cost-saving, resilient, and effective service, and to support active participation and satisfaction from all levels of user. While defining the sustainability of e-government services, the authors have considered two different dimensions—implementation and adoption. The implementation dimension deals with the technology, budget, and human resources required to implement e-governments, whereas the adoption dimension considers the design and approach of e-government service delivery for wider user participation and adoption (Joshi & Islam, 2018). The model is as shown in Figure 3.

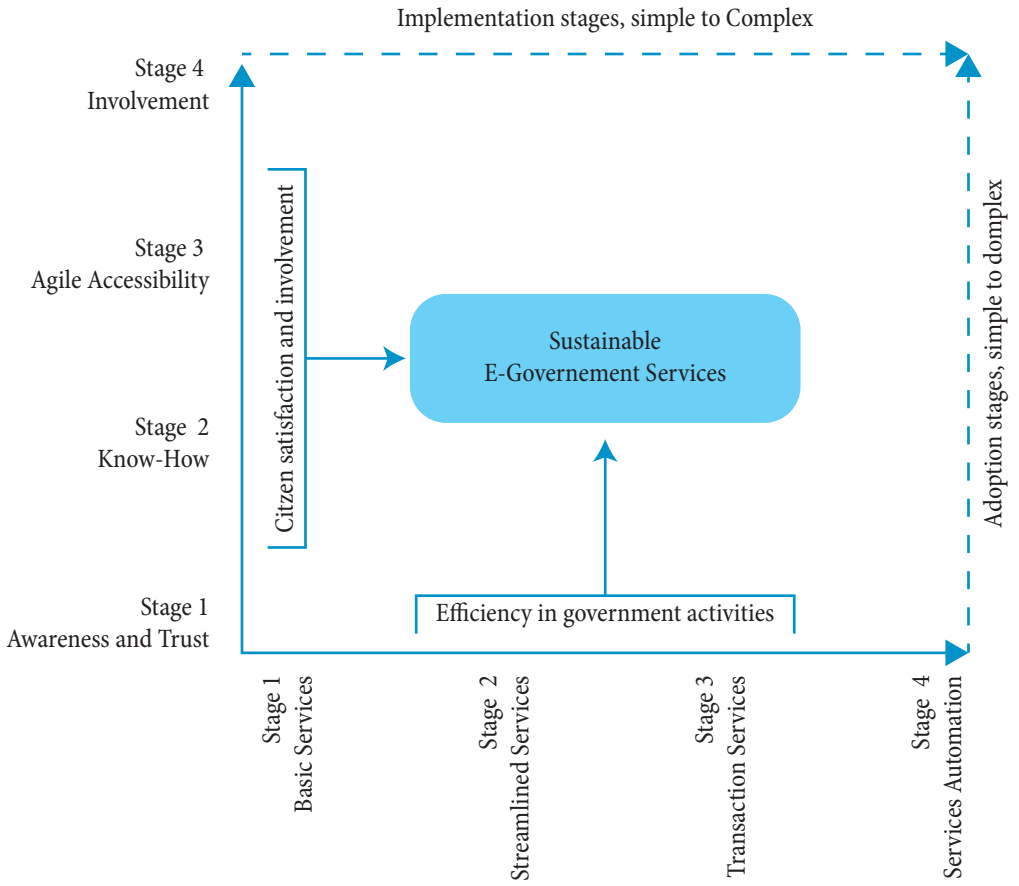


Figure 3 E-government maturity model for sustainable e-government services (Source: Joshi & Islam, 2018)

2.3.3 UN / ASPA– Five Stages of e-Government Development

United Nations Division for Public Economics and Public Administration (2001) study "Benchmarking E-government: A Global Perspective, Assessing the Progress of the UN Member States" identifies the five stages for quantifying progress of e- Government. The study identifies e-Government stages as representative of the Government's level of development based primarily on the content and deliverable services available through official websites.

Emerging: An official government online presence is established through a few independent official sites. Information is limited, basic and static.

Enhanced: Government sites increase; information becomes more dynamic. Content and information are updated with greater regularity.

Interactive: Users can download forms, e-mail officials, interact through the web and make appointments and requests.

Transactional: Users can actually pay for services or conduct financial transactions online.

Seamless: A complete web presence of necessary services are available for a seamless flow of service and information.

To support the government in building a better public service delivery system to build a good governance system, the role of ICT is inevitable. The e-government services are in the form of G2G, G2B, and G2C systems. The maturity of such systems provides an insight on the level of e-government system development its use and the impact it has made in public service delivery. Analyzing the same system with different e-GovMM will allow us to look into the maturity of the systems from different perspectives.

3 RESEARCH METHOD

The research was done using a mixed method, where e-GovMM are used to analyze the status of existing online pre-enrollment system and a purposive survey is done to collect the views of the officials on the system. Literature reviews on public service delivery and e-government helped to link e-government to enhance public service delivery in government. Historical records, published documents, documentaries, and online data on the DoP provided the understanding on the method of service delivery and current improvements ongoing in the DoP to support the implementation of MRPs.

SWOT (Strength, Weakness, Opportunity, Threats) analysis has been performed to understand the strength, weakness, opportunity, and threats while developing an e-government system as well as implementing it (Avny, 2007; Elsheikh & Azzeh, 2017). The tool is useful in identifying the priorities of an organization towards developing a strategy in a particular field of interest, like in case of e-government development also the tool is extensively used SWOT of the e-government development is done within the discourse of "efficiency, productivity, and cost reduction" (Gurel & Tat, 2017). The strengths and weaknesses are internal variables, which can be controlled by the executing agency, while opportunities and threats are external variables, not under the control of organizations, though, in some cases one can exert some influence (Damian et al., 2014). The SWOT analysis helped to identify the strength, weakness, opportunities and threats of the current online pre-enrollment system. The analysis also indicates the strength of technology use in the public service delivery of the department. The more the system has strength the better is the system in serving the citizens.

We did an online survey to capture the views of the officials working in the DoP on the online enrollment system. The collected data were analyzed to obtain the findings, which is used to understand the status of public service delivery through the implementation of the e-government system. The quantitative findings are used supports the qualitative findings.

3.1 Theoretical framework of research workflow

We have adopted a mixed method to perform this research, combining both the qualitative and quantitative methods. The research is a combination of model and survey analysis.

The existing e-government system is analyzed with the help of e-government maturity models (Almuftah et al., 2016; De Brí & Bannister, 2015; Fath-allah et al., 2014) in-order to understand the current maturity level of the deployed e-government system. Then we performed a SWOT (Strength-Weakness-Opportunity-Threat) analysis of the system to strengthen the results from the maturity model analysis. The analysis provides the existing scenario of the e-government system currently used to provide the online enrollment of passport application. We performed the model analysis through observation of the online system, documentary, and YouTube interviews about the status of service delivery at DoP. Then we performed an online survey with the selected officials of MoFA, who are working or worked at DoP to get their views on the public service delivery status through the online pre-enrollment system. From the analysis of the model and the survey results, we analyzed the status of improvement in public service delivery through the e-government implementation. Figure 4 shows the theoretical framework of the research method used in the research work.

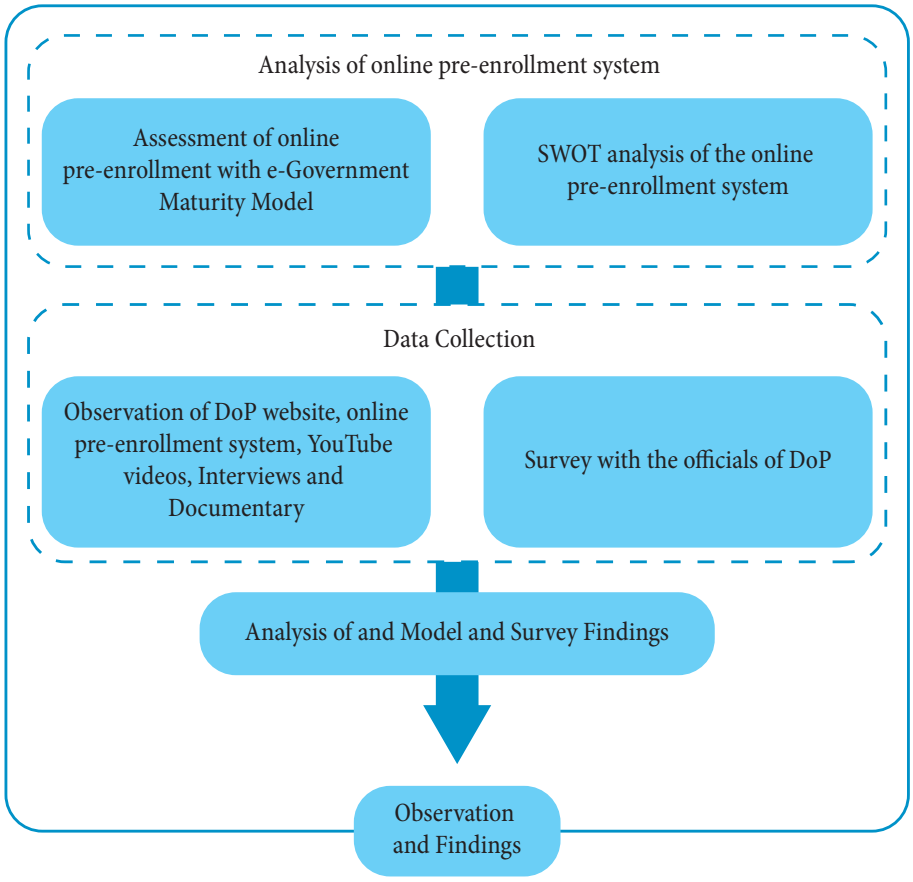


Figure 4 Theoretical framework of research workflow

3.2 Research Design

We have used a mixed method of research design to perform the research work, which follows the sequential exploratory strategy. The strategy involves a first phase of qualitative data collection and analysis, followed by the a second phase of quantitative data collection and analysis that builds on the results of the first qualitative phase (Creswell, 2015). The weight is placed on the first phase, and the data are mixed through being connected between the qualitative data analysis and the quantitative data collection. The research design method is as shown in Figure 5.

Figure 5 Research Design

3.3 Data Source

We collected the data through the website of DoP and other online portals. We did a thorough observation of the online pre-enrollment system. We collected the secondary data from the reports, websites, and YouTube interviews. In addition, we administered online survey to the officials of DoP to understand their inputs on the public service delivery of DoP through the online pre-enrollment system.

3.4 Study Area

The study area of the research is the public service delivery of GoN and our study focuses on the service delivery of DoP as a case, situated in Kantipath, Kathmandu.

3.5 Data Collection Tools

We collected the data through the observation of the online pre-enrollment systems, interviews of the service seekers in YouTube channels, and exploring the website of DoP and report published in the website. We performed a purposive sampling survey with the officials working in the MoFA. To prepare the survey questionnaire we considered the indicators that points towards the performance of service delivery as described by Talukder, 2015. The indicators are as listed in Table 3. The survey questionnaire is attached in Appendix I. We collected the response in five-point Likert scale that varies from strongly disagree to strongly agree.

Table 3 Indicators measuring the performance of service delivery (Source: Talukder, 2015)

	Indicators	Measuring Indicators
Performance of Service Delivery	Responsiveness	Promptness of service – Number of visits – Waiting time – Delivery period – Processing time
	Reliability	Accuracy of service Consistency and dependability of service (easy tracking of service progress)
	Assurance	Credibility of service (Access to required information)
	Empathy	Easy access and communication Less suffering
	Cost Saving	Travel Cost Extra Payment Cost of operation

3.6 Limitation

The limitation of the research is the use of limited primary data due to the ongoing lockdown imposed by the government to fight against the COVID-19. The public service delivery from the side of service provider, i.e., DoP, GoN is captured through the primary data. The citizens could not be involved directly to get their part of story, so secondary data sources have been used to put the views of the citizens. Hence, the analysis is done on the base of the data available on department websites, YouTube interviews of the service seekers, documentary on the online pre-enrollment system of the DoP, response from the officials of MoFA and observation of the department website.

4 FINDINGS

The online pre-enrollment system of DoP is examined using the e-Gov MM to identify the status of the online system.

4.1 Layne and Lee Model

The observation of the maturity of the online pre-enrollment system using the Layne and Lee model has been listed in Table 4.

Table 4 Observation of the initiatives of various stages of online pre-enrollment system using Layne and Lee model

Stages	Initiatives
Catalogue	DoP Website, Facebook, Twitter, YouTube
Transaction	Online Form Submission, Online Payment System, Digital Storage of Data
Vertical Integration	Not Available
Horizontal Integration	Data sharing using Application Programming Interface (API) with Foreign Employment Department and Immigration Department

The observation of various initiatives done by DoP to make the service of the department available through the online pre-enrollment system are listed in Table 4. The table shows that almost all the stages of the maturity model have been initiated to certain extent.

1. The first stage of model identified as catalogue has been achieved with initiatives like the hosting of department website and social media pages to share information. Through the website and social media pages all the relevant information is catalogued and shared to the service-seekers. The information like "What is MRP?", "How to apply?", "Where to apply?", "Newsletter", "News and Notices", "Press Release", "Citizen Charter", "Acts and Rules", "Proactive Disclosure", "Downloads", "Organizational Information", "Instant Facebook Chat", "Department app downloads", and "Social Media Links" are placed on the website. These initiatives indicate that the first stage is fully achieved in

the e-government implementation at DoP.

2. The second stage of model is transaction where the citizens can transact information with the government using the online forms. The stage in the online pre-enrollment system has been achieved as the citizens can transact data using the online submission forms and the online payment system. The live enrollment system has been deployed in the DoP and 10 diplomat missions abroad for data entry. The system has allowed the transaction of data and payment instructions, after which the applicants have to visit DoP or send the applications through the concerned district administration offices. The transacted data are kept in the digital data storage of the department for further processing. The stage has also been fully achieved in DoP and has reduced the number of physical communications between the DoP and the service-seekers. Also, the online pre-enrollment system has facilitated the online payment system and reduced of the processing time as all the required information is received in advance than in the paper-based system where the information is extracted through scanning of the paper-based forms once the forms are submitted to the department.
3. The third stage of the model is vertical integration stage where the similar organizations at local, state, and federal level are connected for shared data processing. In case of DoP the vertical integration has to be initiated once the passport office at different levels of government in Nepal is fully active. So currently in case of DoP the stage is not active.
4. The fourth stage of the model is horizontal integration stage, where different agencies having different functionalities are connected to provide one stop shop for government services to the citizens. This stage has not been achieved as the department cannot perform online verification of the citizens' information from district administration office, so the applicants have to get their citizenship verified manually from the respective District Administration Office (DAO). DoP has started to share the information to the Department of Foreign Employment (DoFE) and Department of Immigration (DoI) through the Application Programming Interface (API).

4.2 E-Government Maturity Model for Sustainable E-Government Services

The second method used to examine the online pre-enrollment system of DoP is E-Government Maturity Model for Sustainable E-Government Services as proposed by (Joshi & Islam, 2018) that examines the online system through implementation and adoption perspectives. The findings are listed in Table 5 and 6.

Observing the online pre-enrollment system implementation of the DoP through the implementation perspectives of E-Government Maturity Model for Sustainable E-Government Services as shown in Table 4 it can be concluded that the system fulfills the Basic Services criteria. Most of the activities of this stages are satisfied through various initiatives done by the department.

Streamlined Service has not yet been achieved fully, which requires improvements in infrastructure and integration platforms. The systems are not able to provide automated

Table 5 Examining the implementation perspectives of online pre-enrollment system (Source: (Joshi & Islam, 2018))

Implementation Perspectives							
Basic Services		Streamlined Services		Transaction Services		Services Automation	
Activities	Status	Activities	Status	Activities	Status	Activities	Status
Computerization of the government departments	Fully Achieved	Enhance networking and connectivity	Networking and connectivity has not been achieved to satisfactory level	Government legislations for electronic data processing	Electronic Transaction Act, 2008	High-level integration	Not Achieved
Cataloguing the information	Digitized data is stored at DoP	Establish an interoperability framework	Nepal E-Government Interoperability Framework (NeGIF), was introduced in 2010 but not practiced openly by organizations	Establish a verification mechanism	Not Achieved	One-stop shop	Not Achieved
Website development & social media presence	Website (https://nepalpassport.gov.np/) Nepal Passport App Nagarik App Department of Passport, Nepal, @dopmofa https://www.facebook.com/dopmofa/ Twitter (https://twitter.com/DGpassport) Facebook Chat Window in website Department of Passport, YouTube Channel	Identify integration platforms	Identification of cloud platform for its computing needs, and to deliver e-government services but in very primary stage of implementation.	Establish a payment gateway	Connect IPS, e-Sewa	Synchronization	Not Achieved
Building awareness	Facebook Page 24,429 Likes 24,412 Followers Twitter 4,732 Followers YouTube Channel, 212 Subscribers, 1 Video			Roll out online services	Live enrollment system at DoP and 10 Foreign Missions		

services for document verification, due to which the applicants have to visit district administration offices for the document verification issues. So, it can be understood that the pre-enrollment system is still to achieve the streamlined services and automation services fully. This is dependent not only in the development and implementation of the e-government systems but on the readiness of the users and the country as a whole, which is represented by the E-Government Development Index (EGDI), released by UN. The positive side is the regular improvement of Nepal in the ranking. This indicates the commitment of the government in investing in the factors that influence the index.

In the Transaction Services phase, the activities like development of government legislations for electronic data processing and establishment of payment gateway have been achieved. However, the online verification mechanism has not been achieved. So, the transaction service is partially achieved in the online pre-enrollment system of DoP.

For the Services Automation phase, none of the activities is achieved with the online pre-enrollment system. This demand policy-based work to be done to provide a one-stop shop for citizens through the implementation of an e-Government system.

Observing the different stages and mechanisms involved through the adoption perspectives as proposed by Joshi and Islam, 2018 it is found that the mechanisms for the online pre-enrollment system provided by DoP has average status. The observations of various initiatives are shown in Table 6. There are initiatives to create awareness and trust about the system through awareness videos, social media pages, and department documentary. The know-how is limited to the people who have access to the information either traditionally or electronically. The agile accessibility is yet to be realized as people are not able to apply digitally from the DAOs and Area Administration Offices. Also, the citizens are not involved in the development process of the system. The online system is developed on the basis of service improvement mechanism by the government, where the user perspective has been neglected.

Table 6 Examining the adoption perspectives of online pre-enrollment system (Source: (Joshi & Islam, 2018))

Adoption Perspectives		
Stages	Mechanism	Status
Awareness and trust	Campaigns	Fixed number of programs in a fiscal year
	ICT workshops	None
	Laws ensuring the security and privacy of online transactions	Electronic Transaction Act
	Online presence in social media platform	Available in Facebook, Twitter, and YouTube
	Web content and it's quality	Good
	Quality of service	ISO certified
	User friendly web design	Yes
Know-how	Trainings and Seminars	Awareness programs, Digital notice boards
Agile accessibility	Rural municipalities	District Administration Office, Area Administration Office
	Local libraries	Not Available
Involve		People not involved

4.3 UN / ASPA– Five Stages of e-Government Development model

The online pre-enrollment system is also examined using UN / ASPA Study – Five Stages of e-Government Development model and the observation is listed in Table 7.

Table 7 Examining the various stages of online pre-enrollment system development using UN / ASPA– Five Stages of e-Government Development

Stages	Statements regarding online service delivery	Online service delivery score for DoP
Stage 1 (Emerging Web Presence)	Online presence of DoP is available.	1.00
Stage 2 (Enhanced Web Presence)	Is the website of DoP updated? Are all Acts/rules/Gazette/Circular related to this office available there? Is Citizen charter available in the website? Contacts no's, email ID of responsible officials available there? Are procedures for getting passport available? Are requirements for getting passport well specified? Are the delivery period, cost of service well specified? Downloadable forms and files available.	1.00
Stage 3 (Interactive Web Presence)	Online application submission for passport. Providing application number against application. Online/SMS notification of required documents for passport processing. Online/SMS notification of application submission. Online/SMS notification of progress of passport processing. Facility for citizen feedback/comments on the service mechanism.	0.67
Stage 4 (Transactional Web Presence)	Online financial transaction (e.g. online payment through card)	1.00
Stage 5 (Fully Integrated Web Presence)	Automatic validation of record. Automatic processing of application. Electronic authentication of the citizen's identity. Inter-connected to other departments.	0.00
	Index of Online Service Delivery	0.734

The E-Governance Readiness Index is measured by Online Service Delivery Status and presented in Table 7. It is measured by the ratio of scores obtained divided by total points for each stage of online service delivery and then averaging the scores. The score for each indicator is binary (1/0) based. From the observation presented in table 6, stage 1, 2 and 4 activities are fully achieved by the online pre-enrollment system. The stage 3 activities are partially achieved and the stage 5 activities are not achieved at all. The overall index of online service delivery is 0.734 which indicates the moderate maturity of the system.

4.4 SWOT Analysis

Observing the detail working mechanism of the online pre-enrollment system, YouTube videos on the feedback of the working of the online pre-enrollment system of the DoP by various people a SWOT analysis of the online pre-enrollment system is done as presented in Table 8.

Table 8 SWOT analysis of online pre-enrollment system

Strength	Weakness
– Reduce time for document processing – Reduce response time from initial customer contact – Improves bulk data management	– System reliability and interoperability among several technology platforms – In several cases, end user interfaces are too complicated
Opportunities	**Threats**
– Improvement of digitization of personal information. – Improvement of digital awareness to minimize Digital Divide. – New potentials for creating 24/7 timeframe for application management. – Releases civil servant work hours from routine work to high-skilled tasks – Establish exchange of information	– Decline of the national economy and budget deficiency. – Blind trust on IT potential for diminishing costs. – Data security – Outsourcing of the crucial public sector tasks to private sector – The e-readiness of the targeted audience.

4.5 Survey Results

Purposive sampling was done with the officials working at MoFA deputed at the DoP previously or at present time to rate the pre-enrollment system of DoP for online application processing in order to measure the performance of service delivery. The descriptive statistical analysis of survey responses is presented in Table 9. From the online survey form 32 responses were received from the officials of MoFA, who worked previously or

are currently working at DoP. 28 respondents are male and 4 of the respondents are female participants. Majority of the respondents are class III officers (24), 7 of them are senior assistant, and one of the respondents is class II officer. 20 of the participants have education of post-graduate or above, 11 of the participants are graduate, and one of the participants has higher secondary education degree. The age of the respondents varies from 20 to 40 years.

Table 9 Survey Results

How will you rate the present pre-enrollment system of DoP for online application processing? [Choices 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree]									
		Choices					Mode	Mean	Standard Deviation
S.No	**Ease of Use**								
201	The public find online pre-enrollment system is easy to use.	1	2	3	4	5	4	3.59	1.01
202	The public find online pre-enrollment system user friendly.	1	2	3	4	5	3	3.62	0.97
	Responsiveness								
301	The online pre-enrollment system has reduced the application time.	1	2	3	4	5	5	3.91	1.06
302	The online pre-enrollment system has reduced the application processing time.	1	2	3	4	5	5	4.16	0.95
303	The feedback/complaint mechanism is easier for public.	1	2	3	4	5	4	3.53	1.16
	Reliability								
401	The public can check the status of passport processing online.	1	2	3	4	5	4	3.09	1.23
402	The error in information uploading is reduced	1	2	3	4	5	4	3.81	0.86
	Assurance								
501	The public like to have the online payment system with the pre-enrollment system.	1	2	3	4	5	4	4	0.84

502	The public is ready to provide required personal information online.	1	2	3	4	5	5	3.78	1.13
503	The public is satisfied with the online pre-enrollment system.	1	2	3	4	5	4	3.78	0.79
	Empathy								
601	The public can easily communicate with DoP through the online system.	1	2	3	4	5	3	3.16	1.11
602	The public takes the help of intermediary to fill the information in the online pre-enrollment system.	1	2	3	4	5	4	3.97	1.03
	Cost Saving								
701	Office travel cost is less due to the use of the online pre-enrollment system.	1	2	3	4	5	4	3.53	1.19
702	The public have spent extra in passport application despite of the online pre-enrollment system.	1	2	3	4	5	4	3.37	1.07

4.6 Discussion

The research involves both the qualitative and quantitative data collected by the researchers through observations, historical records, online-survey and websites. Three e-GovMM are used to examine the maturity of the online pre-enrollment system. The findings showed that the system has achieved medium level of maturity where the transaction of information has been possible through the online platform. The implementation maturity status of the e-government system in DoP is in the transaction state, where the citizens can transact required information with DoP through the online pre-enrollment system. The e-government system should provide a fully automated service from the government and citizens also think from the same perspectives as the government is responsible to provide the service once the payment for the service has been made. The complete automation of government services in case of Nepal has not been achieved due to the existing bureaucratic structure and working mechanism. Most of the organizations have developed the e-government systems in silos that provides organizational services to the citizens but the services of the organizations have not been interlinked due to which a complete automation has not been attained. This

has not provided the whole of a government effect in the implementation of e-government system. The citizens are compelled to use different digital gateways to obtain the services from various government organizations including verification of documents, which is very much necessary before requesting for any kind of services from the government from birth registration to passport issuance.

Despite the silo initiation the online pre-enrollment system implementation at DoP has reduced the processing time as the error and time associated with data-acquisition from the citizen has been reduced. Despite the low level of development in telecom infrastructure development index (0.2413) the e-participation index (0. 7809) is high as pointed out by the EGDI released by UN. This indicates that people are inclined in using the available e-government systems to obtain the required services. Thus, it can be analyzed from the findings that the online pre-enrollment system has helped in the improvement of the public service delivery of DoP, which can also be supported with the passport distribution data released by DoP as shown in Table 10.

Table 10 Passport distribution data (Source: DoP)

Fiscal Year	DoP	District	Missions	Total
067/68	162558	9747	1457	173762
068/69	206639	195510	5383	407532
069/70	229404	304549	34174	568127
070/71	450671	426380	135688	1012739
071/72	452155	542409	342274	1336838
072/73	269944	473795	126607	870346
073/74	192375	344564	20249	557188
074/75	189635	328655	13343	531633
075/76	171267	333062	10817	515146

There are several researches by (AA et al., 2015; Adejuwon Kehinde David, 2012; Bartoli et al., 2015; Cho, 2017; Marasini & Shakya, 2015b; Prakash, 2016; Singh & Singh, 2018; The Asian Disaster Preparedness Centre, 2016; Van De Walle & Hammerschmid, 2011) that indicate the need for more efficient e-government systems in order to provide services to the citizens. The dissatisfaction forms the side of citizens is mainly due to the silo functionalities of the available e-government systems. The e-government implementation in Nepal started with the concept of generating transparency in the public service delivery. The silo systems have been able to provide transparency at the organizational level but not at a national level, which requires integration among the systems where a citizen is represented by a single dataset. The integration of the system requires e-government system development in a whole

of a government perspective. The system development concerns not only user interfaces or system interoperability but also broader issues in the administrative culture and how civic servants approach their work. Public sector employee well-being and motivation in their tasks are essential in e-government development. Employees see that there are new ways of governing governance and this provides a good motivation and impetus. Fundamentally, the question is about resistance to change and the embedding of learned practices. Thus, e-government development is far more than just creating new software or interface solutions and the online pre-enrollment system should also consider the same modality of development to make the system robust and mature. The maturity of e-government systems will help to obtain the objectives of e-government system development that in turn will help to improve the public service delivery in a country. The findings also indicate that the interoperability of the system is still lacking as well as there is no exchange of information through online platform for information verification purpose. The exchange of information among various departments across different organizations and the various departments among same organization is very much necessary for the automation of the system. The automation in the system is the ultimate goal of any e-government system and the system will obtain the maturity. The level of service citizen are seeking is only possible after the establishment of interoperability and exchange of information among the government agencies through the digital platforms. The existing digital divide due to the uneven development also hampers the maturity of the system, which effects the mode of digital service delivery.

The mature systems will be a complex e-government system that can provide services to the citizens through a one-stop shop, and that is what citizens picture of while using an e-government system. Thus, the current maturity of the online pre-enrollment system has helped in enhancing the passport application process, which has improved the existing mechanism of public service delivery of DoP. The service delivery needs to be one-stop service mechanism, which requires concerned stakeholders to come together and work in the development of a holistic view of utilizing e-government systems for public service delivery.

5 CONCLUSION

The summary of the findings on the maturity of the online pre-enrollment system currently deployed at DoP using three different e-GovMM are in the Table 11.

Table 11 Findings through the maturity models

Lyane and Lee Model		E-Government Maturity Model for Sustainable E-Government Services				UN / ASPA– Five Stages of e-Government Development model	
		Implementation		Adoption			
Catalogue	Fully Achieved	Basic Services	Fully Achieved	Awareness and Trust	Partially Achieved	Emerging Web Presence	Fully Achieved
Transaction	Fully Achieved	Streamlined Services	Partially Achieved	Know-How	Partially Achieved	Enhanced Web Presence	Fully Achieved
Vertical	Not Achieved	Transaction Services	Partially Achieved	Agile Accessibility	Not Achieved	Interactive Web Presence	Fully Achieved
Horizontal	Not Achieved	Services Automation	Not Achieved	Involve	Not Achieved	Transaction Web Presence	Fully Achieved
						Fully Web Presence	Not Achieved

From the summary table it can be concluded that the online pre-enrollment system has fulfilled the basic stages of the maturity models. The basic stage involves the presence and deployment of the organizational website to share information and perform information transaction. Hence the transaction state of maturity is achieved by the online pre-enrollment system. Due to this citizen can use the website to obtain information for passport application and provide the application through the website. Some of the stages are partially achieved. The lack of mechanism for relevant information exchange between similar and different organizations at various level have hindered in the service automation and fully web

presence of the department.

From the SWOT analysis presented in section 5.4 we deducted that there is reduction in passport processing time due to the present maturity level of the online pre-enrollment system, there is also fair reduction in the response time, and there is improvement in bulk data management. Even in the obtained level of maturity, the system has weakness like reliability and interoperability and in some cases; the user interfaces are still complicated. There are opportunities to improve the digitization of the personal information, improve the digital awareness to reduce the Digital Divide, potential of creating 24/7-time frame for passport application, releasing civil servants for high-skilled tasks and establish exchange of information.

At the present maturity of the online pre-enrollment system, it has helped to reduce the application processing time by digitizing the information at the start of the application process. An argument can be made from the observations of e-Government maturity models and SWOT analysis that "The online pre-enrollment system implementation in DoP has helped to improve the passport processing process." At present, a citizen can acquire passport in 1, 2 or 3 days that can be new and renewal, damaged or having any personal error from DoP. The reduction in time has been possible with the use of to the online pre-enrollment system that has reduced the time for digitization of the data for application processing compared to the paper-based system that generated many errors while digitizing the form by the officials. In addition, the paper-based task is very much tedious where the time consumption is very high for digitizing the data and further processing. The online pre-enrollment system collects data directly from the applicant so the chances of error in data entry is almost none. The live enrollment system at DoP and 10 foreign missions abroad captures photo including the required information, which has further sped up the passport processing time. The pre-acquisition of the data as well as the live enrollment system helps in fast processing at the DoP after the data verification step.

Observing the descriptive statistical values of survey response presented at Table 9, we can be deduct that most of the officials who participated in the online survey agree that the system is easy to use. They also agree on the reduction of application time and application processing time with the use of the online pre-enrollment system. The officials have neutral response in the reliability of the system, with majority of the respondents agreeing on the indicators of the reliability. The officials agree that the citizens have been taking the support of the intermediary in the online application process, despite of having all the necessary instructions online. The officials also have neutral thought on cost saving with the use of the online pre-enrollment system where majority of the respondents agree on the indicator response. The mode of the individual questions also supports the positive response of the officials as shown by the mean value. The lower values of the standard deviation of all of the responses indicate that the responses are not widely dispersed. From the response statistics, we conclude that the officials agree on the improvement of service delivery through the existing maturity of the online pre-enrollment system.

The additional services of online payment system have also helped to improve the process by accepting the digital payment system to enhance the application process. Thus, the findings through the observation of the system maturity through the e-Government Maturity Models, SWOT analysis and the online survey with the officials help conclude, "The online pre-enrollment system implementation in DoP has helped to improve the passport processing process."

Even though the system came into implementation after the mandatory requirement of ICAO to replace the paper based passport with electronic one this has helped in the e-government initiatives of GoN too. Further, the study on improving the maturity and popularity of the system is necessary so to make the system citizen-centric.

REFERENCES

AA, A., MO, O., & SO, Y. (2015). Impact of E-Government on Governance Service Delivery in Nigeria. International Journal of Advances in Management and Economics, 4(3), 132–138.

Adejuwon Kehinde David. (2012). From E-government to E-governance: Wither African Public Administration? 64 Advances in Arts, Social Sciences and Education Research, 2(1), 63–75. https://www.researchgate.net/publication/325909242_From_E-government_to_E-governance_Wither_African_Public_Administration

Ajibade, O., Ibietan, J., & Ayelabola, O. (2017). E - Governance Implementation and Public Service Delivery in Nigeria: The Technology Acceptance Model (TAM) Application. Journal of Public Administration and Governance, 7(4), 165. https://doi.org/10.5296/jpag.v7i4.11475

Almuftah, H., Weerakkody, V., & Sivarajah, U. (2016). Comparing and Contrasting e-Government Maturity Models : A Qualitative-Meta Synthesis. Electronic Government and Electronic Participation, 0, 69–79. https://doi.org/10.3233/978-1-61499-670-5-69

Avgerou, C. (2008). Information systems in developing countries: A critical research review. Journal of Information Technology, 23(3), 133–146. https://doi.org/10.1057/palgrave.jit.2000136

Avny, A. (2007). SWOT analysis of e-Government. Universitatii Bucuresti. Analele. Seria Stiinte Economice Si Administrative, 1(1), 43–54. https://search.proquest.com/docview/1672865416?accountid=14744%0Ahttps://cbua-us.primo.exlibrisgroup.com/discovery/openurl?institution=34CBUA_US&vid=34CBUA_US:VU1&lang=es?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:

Bartoli, G., Fantacci, R., Gei, F., Marabissi, D., & Micciullo, L. (2015). A novel emergency management platform for smart public safety. International Journal of Communication Systems, 28(5), 928–943. https://doi.org/10.1002/dac.2716

Basyal, D. K., Poudyal, N., & Seo, J. W. (2018). Does E-government reduce corruption? Evidence from a heterogeneous panel data model. Transforming Government: People, Process and Policy, 12(2), 134–154. https://doi.org/10.1108/TG-12-2017-0073

Basyal, D. K., & Seo, J. (2016). What Should We Do for E-government in Nepal and How ? The Korean Journal of Policy Studies, 31(3), 47–74.

Benssam, A., Nouali-Taboudjemat, N., & Nouali, O. (2014). Requirements for an IT based platform for disaster management. 2014 1st International Conference on Information and Communication Technologies for Disaster Management (ICT-DM), 1–4. https://doi.org/10.1109/ICT-DM.2014.6917784

Bhattarai, P. C. (2017). Reform in Public Service Delivery in Nepal : Demand or Supply Driven ?

Bongiorno, G., Rizzo, D., & Vaia, G. (2017). CIOs and the digital transformation: A new leadership role. CIOs and the Digital Transformation: A New Leadership Role, 1–230. https://doi.org/10.1007/978-3-319-31026-8

Budding, T., Faber, B., & Gradus, R. (2018). Assessing electronic service delivery in municipalities: determinants and financial consequences of e-government implementation. Local Government Studies, 44(5), 697–718. https://doi.org/10.1080/03003930.2018.1473768

Cho, J.-S. (2017). Evolution of e-government: Transparency, competency, and service-oriented government with korean government 3.0. Journal of Business and Retail Management Research, 12(1), 62–68.

Creswell, J. W. (2015). Research Design (Third). SAGE.

Damian, I. P. M., Santarem Segundo, J. E., & Merlo, E. M. (2014). SWOT analysis of the services provided by e-government sites in Brazil. Procedia Computer Science, 33, 130–135. https://doi.org/10.1016/j.procs.2014.06.021

Das, A., Singh, H., & Joseph, D. (2017). A longitudinal study of e-government maturity. Information and Management, 54(4), 415–426. https://doi.org/10.1016/j.im.2016.09.006

De Brí, F., & Bannister, F. (2015). E-government stage models: A contextual critique. Proceedings of the Annual Hawaii International Conference on System Sciences, 2015-March, 2222–2231. https://doi.org/10.1109/HICSS.2015.266

Department Of Passport : Nepal. (2020). https://nepalpassport.gov.np/about-us/

DoP, M. (2020). Department Of Passport ::. Nepal. https://nepalpassport.gov.np/about-us/

Elsheikh, Y., & Azzeh, M. (2017). Prioritize E-Government Strategies Using SWOT-Ranked Voting Analysis Technique: The Case of Jordan. International Journal of Computer Science and Network Security, 17(1), 1–7. https://doi.org/10.13140/RG.2.2.27283.94245

Fath-allah, A., Cheikhi, L., Al-qutaish, R. E., & Idri, A. (2014). E-Government Maturity Models: A Comparative Study. International Journal of Software Engineering & Applications

(IJSEA), May 2014, 5(3), 71–91. https://doi.org/10.5121/ijsea.2014.5306

Flak, L. S., & Nordheim, S. (2006). Stakeholders, contradictions and salience: An empirical study of a norwegian G2G effort. Proceedings of the Annual Hawaii International Conference on System Sciences, 4(January). https://doi.org/10.1109/HICSS.2006.436

Giri, S., Shakya, S., & Pande, R. N. (2018). E-Governance implementation: Challenges of Effective Service Delivery in Civil Service of Nepal. Global Journal of Computer Science and Technology: Interdisciplinary, 18(3), 1–9. https://www.computerresearch.org/index.php/computer/article/view/1710/1694

Gupta, A., & Shakya, S. (2015). Information System Audit. 2015 International on Green Computing and Internet of Things (ICGCIoT), 827–831.

Gurel, E., & Tat, M. (2017). SWOT Analysis: A Theoretical Review. The Journal of International Social Research, 10(51), 6–11.

Hood, C. (1991). All Seasons ? Public Administration, 69(1), 3–19. http://dx.doi.org/10.1111/j.1467-9299.1991.tb00779.x

Improving Public Service Delivery in Nepal. (2019). Samriddhi Foundation. https://samriddhi.org/news-and-updates/simplex-model-improving-public-service-delivery-in-nepal/

Inkinen, T., & Merisalo, M. (2014). Measuring e-government efficiency: The opinions of public administrators and other stakeholders. In M.P. Rodríguez-Bolívar (Ed.), Public Administration and Information Technology (Issue January 2016, pp. 171–189). Springer Science. https://doi.org/110.1007/978-1-4614-9982-4_10

Janowski, T., Couros, C. De, & Flor, R. V. (2015). Digital Government Evolution : from Transformation to Contextualization. 32(3), 221–236. https://doi.org/10.1016/j.giq.2015.07.001

Joshi, P. R., & Islam, S. (2018). E-government maturity model for sustainable E-government services from the perspective of developing countries. Sustainability (Switzerland), 10(6). https://doi.org/10.3390/su10061882

Kurfalı, M., Arifoğlu, A., Tokdemir, G., & Paçin, Y. (2017). Adoption of e-government services in Turkey. Computers in Human Behavior, 66, 168–178. https://doi.org/10.1016/j.chb.2016.09.041

Lallmahomed, M. Z. I. I., Lallmahomed, N., & Lallmahomed, G. M. (2017). Factors influencing the adoption of e-Government Services in Mauritius. TELEMATICS AND INFORMATICS, 34(3). https://doi.org/10.1016/j.tele.2017.01.003

Layne, K., & Lee, J. (2001). Developing fully functional E- government: A four stage model. Government Information Quarterly, 18(2), 122–136.

Luk, S. C. Y. (2009). The impact of leadership and stakeholders on the success/failure of e-government service: Using the case study of e-stamping service in Hong Kong. Government Information Quarterly, 26(4), 594–604. https://doi.org/10.1016/j.giq.2009.02.009

Maharjan, M., & Shakya, S. (2015). Technology Acceptance Model : Understanding Local Government Employees Intention in Social Cash Transfer through Branchless Banking in Nepal. 4(12), 203–210.

Manual passports no longer valid. (2015). The Kathmandu Post. https://kathmandupost.com/national/2015/11/23/manual-passports-no-longer-valid

Marasini, S., & Shakya, S. (2015a). E-Readiness : A Study of Infrastructure for E-Government of Nepal. International Journal of Computer Science and Mobile Computing, 4(12), 30–34.

Marasini, S., & Shakya, S. (2015b). E-readiness To Implement E-government. International Conference on Green Computing and Internrt of Things (ICGCIoT), 554–557.

Moatshe, R. M. (2014). E-government iImplementation and adoption : the case study of Botswana Government University of Derby Faculty of Business , Law and Computing Racious Moilamashi Moatshe Study of Botswana Government (Issue October).

Na, E., Huh, Y., Kwon, H., Joo, H., & Won, H. (2013). IT-based development of the national disaster management system in Korea. 2013 International Conference on Collaboration Technologies and Systems (CTS), 287–293. https://doi.org/10.1109/CTS.2013.6567243

Nemoto, Y., & Hamaguchi, K. (2014). Resilient ICT research based on lessons learned from the Great East Japan Earthquake. Communications Magazine, IEEE, 52(3), 38–43.

Prakash, A. (2016). E-Governance and Public Service Delivery at the Grassroots: A Study of ICT Use in Health and Nutrition Programs in India. Information Technology for Development, 22(2), 306–319. https://doi.org/10.1080/02681102.2015.1034639

Scholl, H. J., Kubicek, H., Cimander, R., & Klischewski, R. (2012). Process integration, information sharing, and system interoperation in government: A comparative case analysis. Government Information Quarterly, 29(3), 313–323. https://doi.org/10.1016/j.giq.2012.02.009

Sharma, Yam, & Muwonge, Abdu. (2010). An Opportunity to improve Service Delivery in Nepal through Local Governance. Himalayan Research Papers Archive, 5(1), 87–92. http://hdl.handle.net/1928/11328

Sharma, G., Bao, X., & Peng, L. (2014). Public Participation and Ethical Issues on E-governance : A Study Perspective in Nepal. Electronic Journal of E-Government, 12(1), 82–96.

Shrestha, D., Devkota, B., & Jeong, S. R. (2015). Challenges and Factors affecting E-governance practises in Nepal. 9th International Conference on Software, Knowledge,

Information Management and Applications (SKIMA), 292–299.

Silpakar, S. (2019). Digital Inequality in Nepal [Paris Lodron University of Salzburg, Vrije Universiteit Brussel]. https://eplus.uni-salzburg.at/obvusbhs/content/titleinfo/5061264/full.pdf

Singh, G., & Singh, V. (2018). Citizen centric assessment framework for e-governance services quality. International Journal of Business Information Systems, 27(1), 1. https://doi.org/10.1504/ijbis.2018.10009186

Sodhi, I. S. (2016). Application of e-government in developing countries —issues, challenges and prospects in India. SOCRATES, 4(91), 91–109.

The Asian Disaster Preparedness Centre. (2016). Academy of ICT Essentials for Government Leaders - ICT for Disaster Risk Management (G. Iglesias (Ed.); Second). United Nations Asian and Pacific Training Centre for Information and Communication Technology for Development (UN-APCICT/ESCAP). https://www.unapcict.org/sites/default/files/inline-files/Academy 2.0 Module 9.pdf

United Nations. (2018). E-GOVERNMENT SURVEY 2018 (2018th ed.). Department of Economic and Social Affairs.

Van De Walle, S., & Hammerschmid, G. (2011). The impact of the new public management: Challenges for coordination and cohesion in european public sectors. Halduskultuur, 12(2), 190–209.

Warkentin, M., Gefen, D., Pavlou, P. A., & Rose, G. M. (2002). Encouraging Citizen Adoption of e-Government by Building Trust. Electronic Markets, 12(3), 157–162. https://doi.org/10.1080/101967802320245929

World Bank. (2018). Indicators of citizen-centric Public Service Delivery.

Yau, K. A., Lau, S. L., Wong, M., Lin, Q., Shah, M., & Rahman, A. (2004). Towards a Smart City : the Case of Greater Kuala Lumpur in Malaysia.

Yildiz, M. (2007). E-government research: Reviewing the literature, limitations, and ways forward. Government Information Quarterly, 24(3), 646–665. https://doi.org/10.1016/j.giq.2007.01.002

Zheng, D., Chen, J., Huang, L., & Zhang, C. (2013). E-government adoption in public administration organizations: Integrating institutional theory perspective and resource-based view. European Journal of Information Systems, 22(2), 221–234. https://doi.org/10.1057/ejis.2012.28

Appendix I

Survey Questionnaire for Passport Officials

The survey questionnaire is to collect data for the research entitled "Analyzing the status of improvement in Public Service Delivery through E-Government implementation in Department of Passport (DoP), Nepal" done from Nepal Administrative Staff College. Your answers will remain anonymous and confidential, and will only be used for research purpose. There are no right or wrong answers, please share your experiences and opinions. Thankyou.

यो सर्वेक्षण प्रश्नावली नेपाल प्रशासनिक स्टाफ कलेजबाट गरिएको "Analyzing the status of improvement in Public Service Delivery through E-Government implementation in Department of Passport (DoP), Nepal" भन्ने अनुसन्धानका लागि तथ्यांक संकलन गर्नु हो। तपाईंको उत्तरहरु अज्ञात र गोप्य रहन्छन्, र केवल अनुसन्धान उद्देश्यका लागि प्रयोग हुनेछ। कुनै सहि वा गलत उत्तरहरु छैनन्, कृपया आफ्ना अनुभवहरु र विचारहरु साझा गर्नुहोस्। धन्यवाद।

Section 1: Personal Information								
101	Gender (लिङ्ग)	Male (पुरूष)		Female (महिला)	Other (अन्य)			
102	Age (उमेर)							
103	Current Job Position	Senior Assistant		Computer Operator				
		Class III Officer		Class II Officer				
		Class I Officer		Non-Gazette First Class				
		Other						
104	Education (शिक्षा)	Higher Secondary (उच्च-माध्यमिक)		Graduate (स्नातक)				
		Post-Graduate and Above (स्नातकोत्तर अथवा माथी)						
How will you rate the present pre-enrollment system of DoP for online application processing? पासपोर्ट विभागले हाल प्रयोगमा ल्याएको अनलाइन पासपोर्ट पूर्व-नामांकन संकलन पद्दति तपाईलाई कस्तो लाग्छ? [Rating 1=Strongly Disagree (एकदमै असहमत), 2=Disagree (असहमत), 3=Neutral (बिचमा), 4=Agree (सहमत), 5=Strongly Agree (एकदमै समहत)]								
Section 2: Ease of Use (प्रयोगमा सहजता)								
201	The public find online pre-enrollment system is easy to use. (सर्बसाधारणलाई अनलाइन पूर्व-नामांकन संकलन पद्दति प्रयोग गर्न सजिलो छ ।)			1	2	3	4	5
202	The public find online pre-enrollment system user friendly. (अनलाइन पूर्व-नामांकन संकलन पद्दति सर्बसाधारणको लागि प्रयोगकर्ता मैत्री छ ।)			1	2	3	4	5

Section 3: Responsiveness (प्रतिक्रिया)						
301	The online pre-enrollment system has reduced the application time. (अनलाइन पूर्व-नामांकन संकलन पद्धतिको प्रयोगले आबेदन समय घटाएको छ ।)	1	2	3	4	5
302	The online pre-enrollment system has reduced the application processing time. (अनलाइन पूर्व-नामांकन संकलन पद्धतिले आबेदन प्रक्रियामा लाग्ने समय घटाएको छ ।)	1	2	3	4	5
303	The feedback/complaint mechanism is easier for public. (सर्बसाधारणको लागि अनलाइन पद्धतिमा प्रतिकृया/गुनासो प्रक्रिया सजिलो छ ।)	1	2	3	4	5
Section 4: Reliability (विश्वसनीयता)						
401	The public can check the status of passport processing online. (सर्बसाधारण अनलाइन नै पासपोर्ट आबेदन प्रक्रियाको स्थिति जान्न सक्छन ।)	1	2	3	4	5
402	The error in information uploading is reduced (अनलाइन पूर्व-नामांकन संकलन पद्धतिले बिवरण संकलनमा हुने गल्तिलाई घटाएको छ ।)	1	2	3	4	5
Section 5: Assurance (आश्वासन)						
501	The public like to have the online payment system with the pre-enrollment system. (सर्बसाधारण अनलाइन पूर्व-नामांकन संकलन पद्धतिसंग अनलाइन भुक्तानी सेवा भएको राम्रो मान्छन् ।)	1	2	3	4	5
502	The public is ready to provide required personal information online. (सर्बसाधारणहरू व्यक्तिगत बिवरण अनलाइन पूर्व-नामांकन पद्धतिमार्फत दिन तयार छन् ।)	1	2	3	4	5
503	The public is satisfied with the online pre-enrollment system. (सर्बसाधारणहरू अनलाइन पूर्व-नामांकन पद्धतिसंग सन्तुष्ट छन् ।)	1	2	3	4	5
Section 6: Empathy (सहानुभूति)						
601	The public can easily communicate with DoP through the online system. (अनलाइन पद्धति प्रयोग गरी, सर्बसाधारणहरू सजिलोसंग पासपोर्ट बिभागसंग कुराकानी गर्न सक्छु ।)	1	2	3	4	5
602	The public takes the help of intermediary to fill the information in the online pre-enrollment system. (सर्बसाधारणहरू व्यक्तिगत बिवरण अनलाइन पूर्व-नामांकन पद्धतिमार्फत दिनको लागि बिचौलियाको सहयोग लिन्छन् ।)	1	2	3	4	5
Section 7: Cost Saving (लागत बचत)						

701	Office travel cost is less due to the use of the online pre-enrollment system. (अनलाइन पूर्व-नामांकन पद्दतिको प्रयोगको कारण कार्यालय भ्रमण खर्चकम भएको छ ।)	1	2	3	4	5
702	The public have spent extra in passport application despite of the online pre-enrollment system. (अनलाइन पूर्व-नामांकन पद्दतिको बावजुद सर्बसाधारणहरू आबेदनको लागि थपपैसा खर्च गर्छन ।)	1	2	3	4	5

THE END

Center for Research and Development
Nepal Administrative Staff College
www.nasc.org.np
research@nasc.org.np

ISBN 978-9937-9474-6-6