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Master's Thesis of Public Administration

Analyzing User Satisfaction in E-Government Practices in Nepal:
A Study on the Effects of E-Service Quality of 'Nagarik App' on User Satisfaction

네팔 전자정부 관행의 이용자 만족도 분석
(‘나가릭앱’의 E-서비스 품질이 이용자 만족도에 미치는 영향에 관한 연구)

February 2023

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**Analyzing User Satisfaction in E-
Government Practices in Nepal:
A Study on the Effects of E-Service Quality of ‘Nagarik
App’ on User Satisfaction**

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Abstract

Analyzing User Satisfaction in E-Government Practices in Nepal

(A Study on the Effects of E-Service Quality of 'Nagarik App' on User Satisfaction)

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Purpose: The purpose of this study is to find out which construct of e-service quality of 'Nagarik App' has the greater effect on user satisfaction and examine the users' satisfaction level in regards to e-service quality in Nepal. E-service quality was measured by; efficiency, system availability, privacy, fulfillment, responsiveness, and contact as independent variables. Satisfaction was examined as pleasurable experience and continuance intention of use of 'Nagarik App' as prescribed by expectation confirmation theory.

Design/Methodology/Approach: Quantitative approach was employed to collect the required data. Nepali citizens who are using 'Nagarik App' are considered as the population. A Google-based online survey questionnaire, with filtering question only to collect data from the app user, was administered to collect data. 432 valid responses were analyzed with SAS software. Factor analysis, descriptive analysis, correlation, t-test, and multiple linear regression were performed to test the proposed hypothesis.

Findings: With the results of principle component analysis, all the question items well

represent the corresponding constructs together except for efficiency and system availability measures. Cronbach alpha (contact =0.902, privacy =0.897, responsiveness = 0.858, efficiency =0.838, fulfillment =0.849, system availability =0.840, and satisfaction =0.888) suggested the internal consistency of the items and they represent the constructs well. As the adjusted R square (0.628) suggested, predictors in the regression model showed 62.80% of fitness to explain user satisfaction.

Out of the six independent variables, efficiency (0.241), privacy (0.141), fulfillment (0.328), and contact (0.255) exhibited positive and statistically significant relation ($p < 0.01$) with user satisfaction. On the other hand, responsiveness (-0.038) displayed statistically insignificant negative relationship while system availability (0.045) has a positive but statistically insignificant relationship with user satisfaction. Standardized coefficient estimates suggested that fulfillment (0.323) has relatively the strongest effect on user satisfaction followed by contact (0.295), efficiency (0.210), and privacy (0.155). Responsiveness (-0.042), on the other hand, has the negative and the weakest effect on user satisfaction followed by system availability (0.054).

Among the four control variables, both age (-0.099, $p < 0.01$) and gender (0.117, $p < 0.1$) showed negative relationships with user satisfaction. Education and platform of use did not show any statistically significant relationship with user satisfaction. In sum, four out of six hypotheses were confirmed by the data.

Research Implications: four out of six constructs of e-service quality showed positive and statistically significant relationships with user satisfaction having fulfillment the strongest effect on the dependent variable. Users' perceptions and level of satisfaction are just above the neutral point. Findings suggest that old-age users and female users are less satisfied. Government has to pay more attention to expanding the services making them easier and user-friendly along with special enabling factors for women and users from

old age to bring them into the mainstream of e-governance.

Keywords: e-government, e-service quality, 'Nagarik App', user satisfaction, efficiency, system availability, privacy, fulfillment, responsiveness, contact.

Student ID Number: 2021-26741

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Chapter 1: Introduction and purpose of the research

1.1 Background

The Constitution of Nepal ensures the right to communication and information and freedom of speech as one of the fundamental rights (Constitution of Nepal, 2015). E-governance is gradually being developed in Nepali context as most of the government offices are shifting themselves into the computerized working stations with the motto of people-centered service with transparency (Department of information technology, 2021). The rapid development of information and communication technology, turning the world into a small e-global village, has greatly affected governmental practices. Nepal has adopted Information and Communication Policy with the vision of transforming Nepal into ‘knowledge-based-society’ using information and communication technologies (Ministry of Information and communication, 2015). The e-government development index of Nepal was 0.47 in the year 2018/19 and the current 15th development plan targets to achieve 0.68 till the fiscal year 2023/24 (National planning Commission, Nepal, 2019).

Mobile devices are widely used around the world. Moreover, they are the pocket-mate of individuals. No life can be imagined without mobile phones in modern cities. Different applications that can be administered in mobile devices are shaping the lifestyles. Number of globally sold smartphones to end users in 2021 was 1535.36 million units (O'Dea, 2022), while 339.77 million PCs were sold during the same time (Alsop, 2022). In 2021 alone, the number of total mobile applications downloads was 230 billion times (Ceci, 2022). That means downloading-rate of mobile applications was 7,293.25 times per second. . It demonstrates, unequivocally, the trend of the digital globe is turning to

smartphones and lead by mobile applications.

Governments all around the globe are releasing various mobile applications to provide citizens public services while taking lessons from the practices of the commercial sector. Nepal, having a lower e-government index; ranked 132nd among 193 countries in 2020 and 125th in 2022 (UN E-Government Knowledgebase, 2022), has introduced several e-governmental projects and plans. Unfortunately, most of them encountered with non-utilization and non-compliance, as major challenges, resulting in tardy paced development of e-governance (Achyut, 2021).

1.2 Nagarik App

Every ministry and concerned agency is attempting to convert their offline and paper-based services to 'internet-mediated services' despite the poor performance and progress measured by e-government development index. To overcome the challenges in this sector, Government of Nepal has launched 'Nagarik App ()' translated as 'Citizen Application'. According to (Government of Nepal, 2021), primary goal of the application is to administer efficient, affordable, and timely services for citizens from a single digital platform by connecting the electronic information systems in public institutions.

The primary organization in charge of organizing and supporting the application, at the policy level, is the Office of the Prime Minister and Council of Ministers (OPMCM). The technical administration of the application falls within the purview of the Ministry of Information, Communication, and Technology. A coordinating committee made up of secretaries from the relevant ministries oversees the overall operation of the application. And finally, a technical committee made up of joint secretaries from the relevant ministries evaluates the application's overall effectiveness (Government of Nepal, 2021). With the app, the government of Nepal pledges to put all the governmental services at the

fingertips of the citizens. This app now offers 12 services from various state agencies, and the government is preparing to add more services and eventually to include the relevant agencies from private sector (Nagarik app, 2022).

1.3 How does 'Nagarik App' work?

The 'Nagarik App' is available for both Apple and Android devices. It is readily available at the Android and the Apple Stores online. Following the installation process, users are requested to enter their mobile phone number that is linked to their citizenship-card record. To validate, they will soon receive a "One Time Password (OTP)". Again, it is necessary to confirm personal information (citizenship, voter ID card, passport, or driving license certificate) and link it to the 'Nagarik App'. If the record of the registered phone number and the details of citizenship records are matched, the user will be automatically verified and validated and directed to the services. In case of discrepancies, users are requested to fix the items associated with these two issues (Nagarik app, 2022).

The following figure shows the work process of 'Nagarik App'

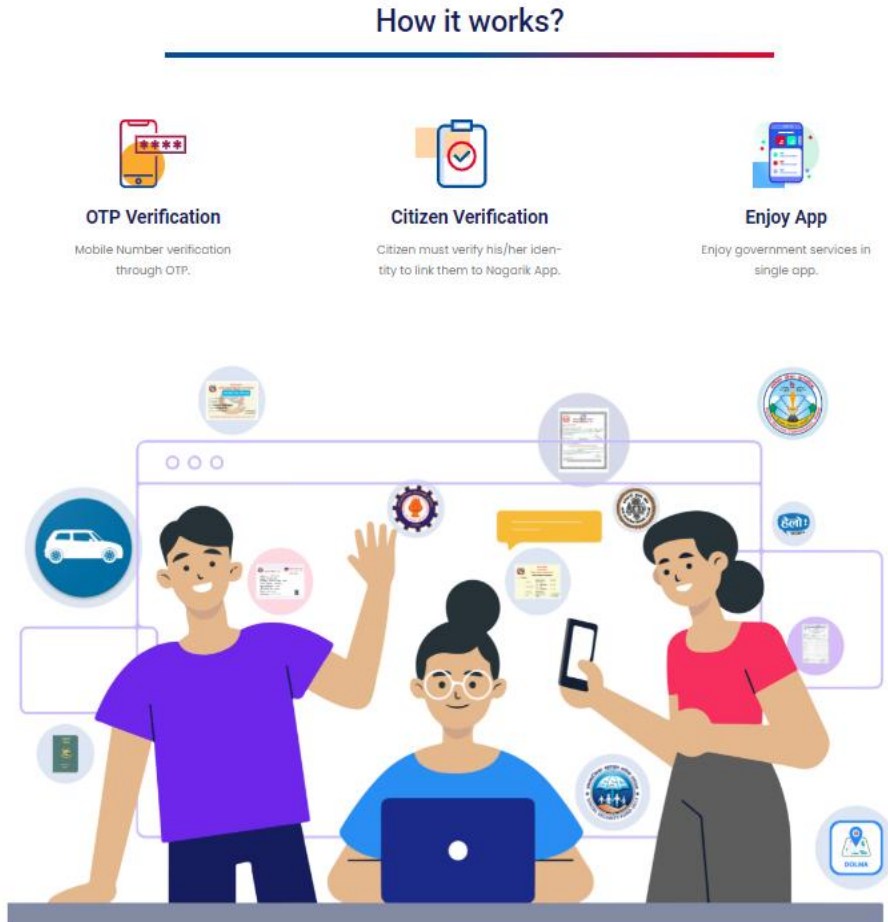


Figure 1: 'Nagarik App'; process for registration

Source: (Nagarik app, 2022)

1.4 What services does 'Nagarik App' offer?

Only 12 services are offered from the application platform. The app is developed and administered with the primary objective of leading the digital e-governance era in Nepal. Analyzing the ambitious objective of the app, the number of the services offered through

this app is not satisfactory. The government is still striving to expand the services to make them accessible through this app. These 12 services offered by 'Nagarik App' according to (Nagarik app, 2022) are:

- Citizenship
- Passport
- Voters Card
- Inland Revenue Department; PAN
- Social Security Fund
- Citizen Investment Trust
- Lok Sewa (Public Service Commission)
- +2 Details (Educational Certificates)
- Hello Sarkar (Hello government)
- Police Clearance Report
- Malpot (Land Registration)
- Vehicle Tax

The services rendered by this application are listed in this picture in 'Nagarik App' website

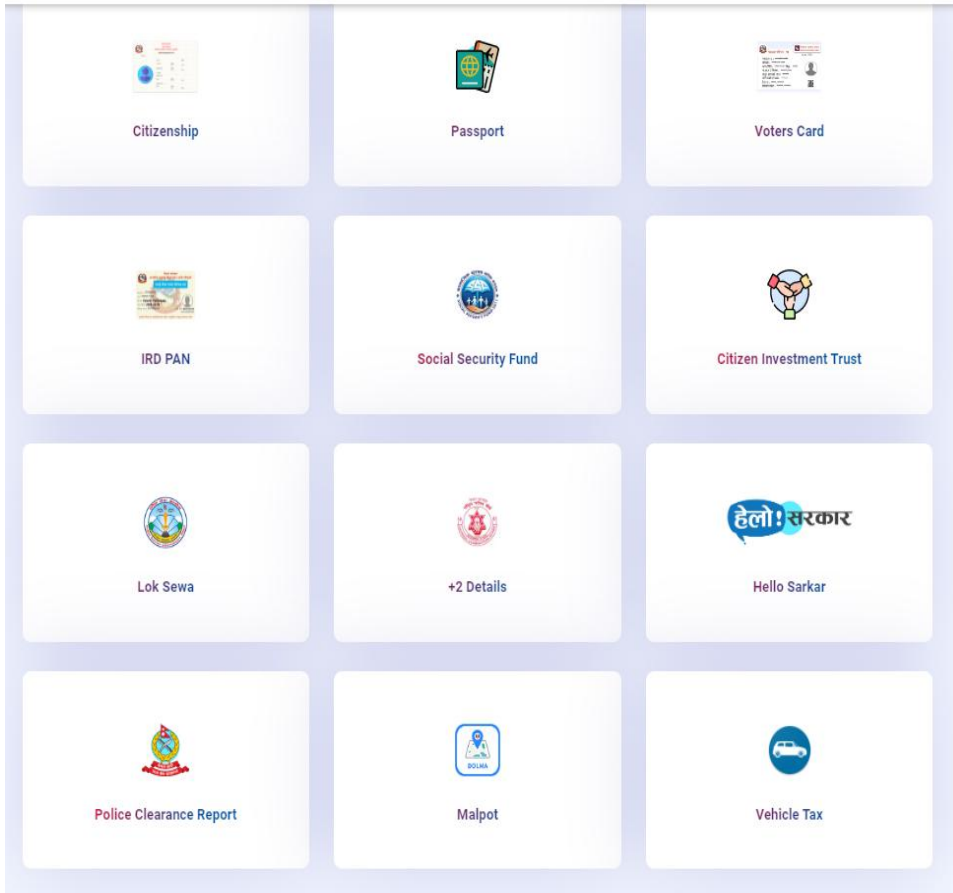


Figure 2: Services offered by 'Nagarik App'

Source: (Nagarik app, 2022)

When analyzing the neighborhood Indian context, 'Nagarik App' has many similarities with the 'Umang' app operated by the government of India. This is the initiative of the Ministry of Electronics and Information Technology (MeitY), India leading towards Unified Mobile Application for New-age Governance. The name of the application; 'UMANG', came from the abbreviation of Unified Mobile Application for New-age Governance. This is a much touted e-government project of the government of India that

will enable people enjoy the varieties of public services available at their fingertips (UMANG, 2017). This application offers 21,840 services from different government agencies in India. Among them, 818 services are central governmental services, 825 are from state-level governments, and 20,197 are related to bill payment. Among the 300 departments registered in the mobile application 151 are union/central agencies and 149 are from the state-level governments. 47.45 million People are using this app and the total transaction made through this application is 3217.4 millions Indian Rupees (UMANG, 2017).

There are substantial differences between the Nepali "Nagarik App" and the Indian "Umang App" in regards to the numbers of the services to be offered. However, there are many fundamental similarities between the two applications as they share the same underlying principles, objectives, ambitions and operational procedure.

1.5 Scope of the study

This research explores the relationship between the e-service quality of 'Nagarik App' and users' satisfaction in Nepal. This is a quantitative, non-experimental, cross-sectional and correlational study. The entire Nepali citizen, currently using 'Nagarik App', is the population for the study. Users' perception was recorded by self-administered Google form-based online survey questionnaire. The questionnaire consists of filtering question to avoid the response from the non-users of 'Nagarik App'.

1.6 Research question

The primary objective of this research is to find out the level of effects of e-service

quality measures on the satisfaction of the users of 'Nagarik App'. This paper will be evolved around these two questions:

- How the users are satisfied in Nepal with the e-service quality of 'Nagarik App'?
- Which construct of e-service quality has the greater influence on user satisfaction?

1.7 Purpose and importance of the study

Very few research works have been found in the field of e-governance in the context of Nepal. There is scarcity of literature on the topic related to e-governance and user satisfaction in Nepal. Service seekers' involvement in e-government services and their satisfaction are relatively new concepts and are 'infrequent or completely absent' in the ministerial websites in Nepal (ParajuliJitendra, 2007). This study has both challenges and opportunities to become a first-ever work in Nepali context to measure satisfaction level of the users of 'Nagarik App'; application-based e-government service.

The government has made a significant move in converting its public services from "in line to online." Three tier governments are embracing ICT-based technologies to enhance their capabilities and performance.

The government may use its power to introduce and enforce applications that are extremely necessary to deliver the required services and can make it compulsory to seek the particular services. But the application guided by the supply side mentality cannot serve the true purposes if they are not user-friendly and do not meet the demands from the citizens. To make the consumers to prefer mobile application-mediated services to offline and paper works in offices, government must focus on the elements that make apps simpler, easier and better for users. So, both of the sides, the authorities as well as the service seekers would be able to maximize their benefits from the application.

The purpose of this study is to examine the overall satisfaction level of 'Nagarik App' users, as well as to find out which element of e-service quality has greater influence on user satisfaction.

The findings of this study, not only will be referential for the betterment of the e-service quality of 'Nagarik App', but also provide important insights and will serve as cornerstone for future projects related to the development of e-service-based governmental applications in central, provincial and local governments in Nepal. The developing countries having similar e-government development index can also benefit from the findings. Also, the application developers and owners of mobile applications in the business, service and manufacturing sectors can benefit from the findings of this research.

Chapter 2: Theoretical background and Literature

review

The dimensions of e-service quality of the "Nagarik App" are used in this study as predictor variables and satisfaction is used as the outcome variable. Around 100 journal articles, websites, and dissertations on the topic of e-governance, service quality and user satisfaction field were reviewed to develop the theoretical background on e-government and e-service quality and user satisfaction. Online library database of Seoul National University, Google Scholar, various academic and governmental websites were consulted to gather information in this regard.

2.1 Theoretical Background

2.1.1 Defining Satisfaction

Satisfaction is a mental state. This phrase has been defined variably by different scholars over time. When the history of satisfaction is traced back, the roots are discovered to be related with purchases and consumption.

According to (RustRoland, VarkiSajeev, OliverRichard, 1997) everyone is familiar with the term satisfaction until he/she is asked to define it. Satisfaction is the response from the consumer which denotes the fulfillment response; a judgment from a customer about the feature of a product or a service that represents the level of fulfillment (over or under) of pleasure. They mainly focused on the response or judgment of a product or service during the time of consumption.

(FornellClaes, 1992) stated satisfaction as the evaluation performed after the purchase has been made. While (BeardenWilliam & TeelJesse, 1983) opined that satisfaction has no concrete definition; it is a function of customers' 'expectations synthesized with product attribute beliefs and disconfirmation'.

Satisfaction is a psychological state when a consumer consumes something and has an after-consumption-feeling towards it and this feeling is compared to the feelings towards the same product prior to the consumption (OliverRichard, 1980). With this explanation, the writer proposed a theory; Expectation-confirmation theory (ECT). Again, (WestbrookRobert & OliverRichard, 1991) defined satisfaction as collective attitude coming together with consumption emotions.

The authors of (HalsteadDiane, HartmanDavid, SchmidtSandra, 1994) focused on consumers' expectation, mentioning that customer's response regarding the fulfillment of their expectations by a consumed product's performance compared to pre-purchased standard. The writers mainly focused on the product's performance and its comparison to already existing standards during the time of consumption or after the consumption. Again, (ManoHaim & OliverRichard, 1993) focused mainly on post-consumption judgment of a product an attitude to evaluate a product after consuming it.

Analyzing different definitions of satisfaction, it is debate-less to say that there are debates on the definition of satisfaction. Researcher notes that satisfaction is a cognitive response that can be affected by several factors such as standards of product, experience of consuming, and experience of purchasing. And, regarding the time of the measurement, it can be measured before going for the final option (expectations), after consumption or the extended experience, and during the time of consumption. Every scholar is accepting

the fact that there is expectation, consumption and mental reaction factors towards the consumed product are the basics to measure satisfaction.

Having this discussion in the background, the researcher finds the ECT developed by (OliverRichard, 1980) for the definition of satisfaction consists of four stages (OliverRichard, 1980):

- 1) Consumer's expectations on particular goods or services
- 2) Using/consuming the goods or services and develop the experience
- 3) Try to make a balance/comparison between the prior expectation and real experience (confirmation or disconfirmation)
- 4) Concludes with satisfaction (repurchase intention) or dissatisfaction (no repurchase intention)

(OliverRichard, 1980), developed the following Expectation-Confirmation Theory (ECT) Schemas

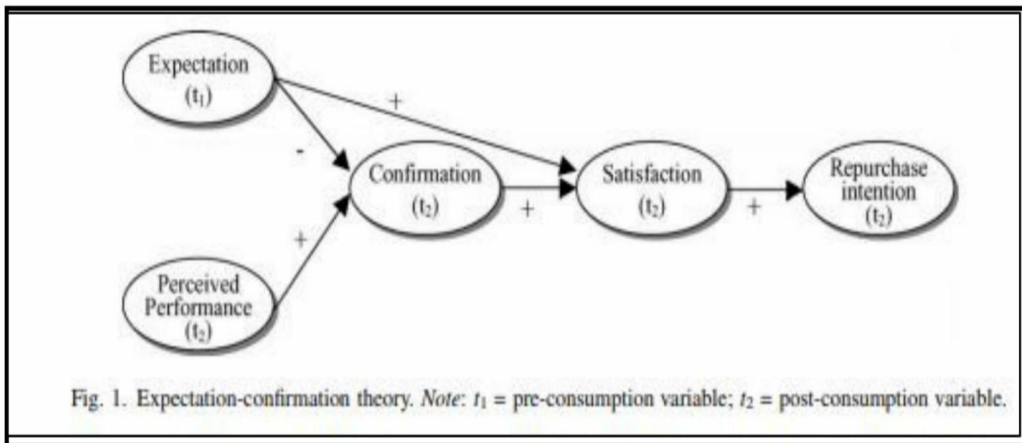


Figure 3: Expectation confirmation theory

Source: (OliverRichard, 1980)

However, (Bhattacharjee, Perols, & Sanford, 2008) criticized this model mentioning that the model has limitations regarding measuring prior usage experience and notions of influence on satisfaction, but at the same time, accepted that this model has been widely used by the researchers to successfully examine the ICT usage satisfaction level with some modifications by the researchers. He proposed his own ‘extended model for ICT continuance’.

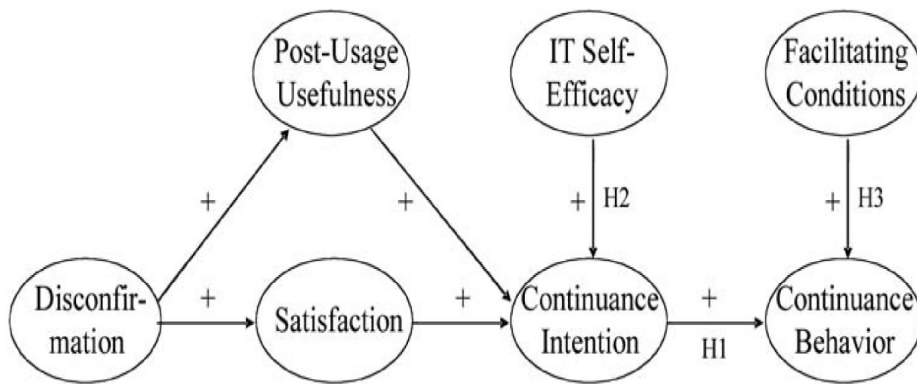


Figure 4: Extended IT Continuance Model

Source: (Bhattacharjee, Perols, & Sanford, 2008)

2.1.2 Factors contributing to affect user satisfaction

(Burgess & Houghton, 2002) developed a model to test the level of user-friendliness of the different Australian government websites and they suggested the same model be used by the researchers to evaluate user-friendliness of the government websites. They proposed openness as one of the criteria with orientation, coverage, currency, accuracy, and interactivity as its subcategories. Also the accessibility to the site and content as second criterion and usability with links design and architecture, metadata, and

navigability as subcategories.

To measure the user satisfaction in relation to e-government services, a comprehensive model was proposed by (Verdegem & Verleye, 2009). First, they proposed an extended conceptual framework for blending the gap between user-acceptance and measuring user satisfaction to have a combined conceptual framework.

(Verdegem & Verleye, 2009) found the factors that are ‘extremely important’ for user satisfaction and e-government based service delivery and clustered them as; 1) access to the service, 2) use of the service, 3) impact of the service. They clustered the list of indicators for satisfaction. They proposed a model (indicators and their importance) and tools for assessing the satisfaction level of the customers for the websites of the governments which are supposed to deliver the services related to the e-governance.

DM IS success model developed by (WilliamH. & EphraimR., 1992), is widely used in the quest for users’ satisfaction with e-government services which they (DeLoneWilliam & EphraimR., 2003) revised ten years later.

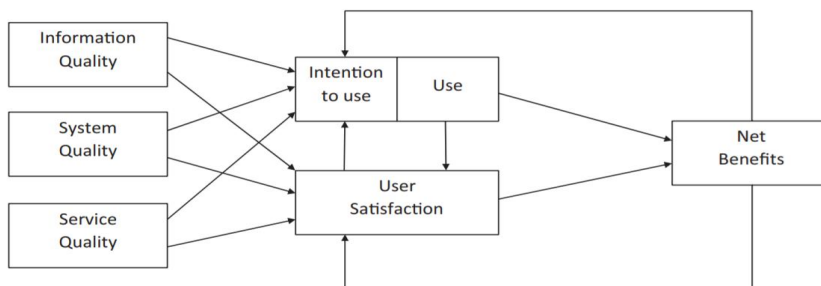


Figure 5: Updated DeLone and McLean IS success Model

Source: (DeLoneWilliam & EphraimR., 2003)

To measure user satisfaction, the level of satisfaction is needed to be quantified. For this, authors (Doll, Weidong, & Gholamreza, 1994) and (Ives, Margrethe, & Jack, 1983), have developed instruments; End User Computing Support (EUCS) and User Information Satisfaction (UIS). Unlike the overall satisfaction measured by other methods, EUCS and UIS measure satisfaction level specifically related to information quality, system quality and service quality.

Analyzing the previous literature, user satisfaction for this study is defined, being based on expectation confirmation theory, as: a pleasurable experience of using 'Nagarik App' and intention of continuance of using it.

2.2 Defining e-governance and e-service quality

2.2.1 E-government

Even though governments paid little attention to internalizing ICTs into governmental processes in the early days, ICTs are already ubiquitous in today's society and governments. Developing nations are progressively incorporating it into their governing approach. Providing governmental services through mobile applications is the most recent kind and method of e-governance. There is growing use of ICTs in governance in both developed and least developed worlds (Bwalya, Tanya, & Chris, 2014). But it is difficult to find the exact definition of e-government as (HalchinL., 2004) mentioned it is impossible to find the universally accepted yardstick to mark the actual definitions of e-governance.

E-government is the condition where government departments and agencies use information technologies that help them to transform the relationships with people,

businesses, and organizations inside the government and those technologies include 'Wide Area Network, internet, and mobile applications' (World Bank, 2015). E-government has been developed to be broader to include everything from "online government services to exchange of information and services electronically with citizens, businesses and other arms of government" meaning the utilization of ICTs in governmental tasks to obtain public goals by 'digital means' (United Nations, 2021).

Using ICTs such as "database, networking, discussion support, multimedia, automation, tracking and tracing and personal identification technologies" apart from the internet and web is also can be defined as e-government (JaegerPaul, 2003). E-government is a defined relationship, between or among the governments and service seekers or the suppliers, established with electronic means, whether they can be citizens, business institutions or intra-government institutions (MeansGrady, DavidSchneider, JamesJ., 2000). E-governance is a tool to disseminate information by the government agencies to service seekers which will enable them to access governmental information, regardless of time and location, without visiting governmental offices physically that contributes to maintaining transparency in governmental sector (Seok-Jin Eom, 2014). According to (BrownMary & JeffreyL., 2001) e-government is using web based technologies to ease access to the government and help to deliver information and service from the government to the related sectors. They proposed three broad categories of e-government efforts; i) Government to Government (G2G), ii) Government to Business (G2B), iii) government to citizen (G2C).

E-government is a widely discussed issue around the world. Making public service near and dear to the people, this is a crucial aspect of governance. Many authors and people think that e-governance is only the adaptation or introduction of online services but it is

not merely the adaptation of online services but the overwhelming use of ICTs in all spheres public sector (V.M.RAO, 2007) cited in (Jerry, 2020). Mentioning the limitations of the definitions of e-governance in the existing literature, (YildizMetem, 2007) opines for value-based definitions putting emphasis on interconnectedness for efficient, effective, accountable, and transparent service delivery.

(Mainali, 2018) sees e-governance as a tool for solving the existing problems in public service saying that Public service is blamed for not being the ‘darling of the people’ and not being able to come out of the ‘bureaucratic sins’, and one of the ways to overcome such issues is to adopt innovative and digital governance. The governments today are under the pressure as their services must meet the higher expectation level of service seekers and they have to do it with higher level of efficiency (WestDarrel, 2004). (Seok-Jin Eom, 2012) explores the impact of institutional arrangements on the evolution of the concept and practice of e-government. Regarding the governmental activities in this field, (Paul T.Jaeger & BertotJohn, 2006) opined that government initiatives are not free of questions as they are only guided by the feasibilities and comfort of the supply side, i.e. of governments. This is because the governments do not have enough money to spend and at the same time, they are subject to fulfill the expectations of their citizen (John CarloBerto & Paul T.Jaeger, 2008).

The primary reason for adopting ICT-led e-governance is much touted public sector reform with a higher level of quality of the services to be extended to people (NorrisDonald & Jae MoonM., 2005). Online services are introduced to meet the demands of service seekers and to improve the quality of the services rendered to the people.

The ultimate purpose of all government programs is to serve and please its citizens, as the government (in a democracy) is founded by their mandate and votes. E-governance, when paired with newest form of Public Service philosophy, has a strong inclination to serve the people, and it is proposed that citizens should be at the heart of the government's initiatives. Citizen satisfaction is recognized as the central idea and crucial indicator of the adaptation and implementation of e-governance (Athmay, Kamel, & Vinod, 2016). The general public and the business communities will be encouraged to use public websites if they are easy to reach, updated, accurate and trustworthy, and simple enough to navigate. Potential advantages from the electronic service will not be going directly to the people if the websites are not user friendly (New South Wales. Audit office. Houghton, Jan; Burgess, Sue, 2002).

2.2.2 E-government development stages

E-government is a relatively a recent notion in comparison to the other governance disciplines. The early history of the internet and computer was littered with immobile machines and networks that were primarily utilized for military purposes, such as ARPANET (Advanced Research Projects Agency Network). In the early days of e-government, the central concern was the computerization of administrative tasks, archive management, and automation. The innovation of the 'World Wide Web (WWW)' by Tim Berners-Lee in 1989 served as a cornerstone for the development of internet-based services. Although there are several literatures regarding "IT in government" from the 1970s, e-government was paid more attention later in the 1990s (Grönlund & Horan, 2004).

Several e-government models have been proposed by scholars throughout time to describe the various stages of e-government. The major models that aim at the

satisfaction of people and the business community can be stated below:

- 1) Garntner's Four stage model (Baum & Di Maio, 2000) cited by (Keng Siau, 2005):

Stages	Description
Web presence:	Web site for basic information publication
Interaction	Websites enable users to contact service providers
Transaction	Websites where users can complete transaction online.
Transformation:	More efficient, integrated, unified and personalized services (transformation from the existing operation procedure)

- 2) UN's Five stage Model: United Nations and American Society for Public Administration (2001) as cited by (Siau & Long, 2005)

Stages	Description
Emerging presence	Formal, limited statistical information from a single or few governmental websites
Enhanced presence	Regularly updated dynamic, specialized information
Interactive presence	Connecting service providers and users for the task to happen in sophisticated way
Transactional presence	Single website for conducting complete tasks and with complete security
Seamless or fully integrated presence	One stop portal for all type of services

3) Deloitte's six-stage model (2001): as cited by (Siau & Long, 2005)

Stages	Description
Information publishing/dissemination	Increased access to information for users
Official two way transaction	Interaction between service providers and users
multi-purpose portals	Single webpage to provide services related to multiple departments
portal personalization	Users are able to customize the web portals according to their own needs
clustering of common services	Unified and seamless services via enhanced collaboration and reducing intermediaries
full integration and enterprise transaction	Ideal state of ICTs implementation which provides highly sophisticated, integrated and personalized services to users

4) Layne and Lee's four-stage model (2001) (Karen & Jungwoo, 2001)

Stages	Description
Catalogue	Basic information through web portal
Transaction	Enabling users to perform simple online transactions
Vertical integration	Integrating governmental functions at different level but not automated systems
Horizontal integration	Integrating functions to make users able to use unified and seamless service

5) Hiller and Belanger's five stage model 2001 (Hiller & Belanger, 2001)

Stages	Description
Simple information dissemination (one way communication)	Most basic form, simply information displaying
Two-way communication (request and response)	Simple interaction between government and service seekers
Service and financial transaction	Transactions between the government and citizens as well as the business
Vertical and horizontal integration	Integration of between or among the hierarchical level and departments of governments
Political participation	Political engagement of citizen through online voting and survey participation

After reviewing all the stages of the e-governance, it can be concluded that governmental mobile-based applications which are claimed to be more efficient, integrated, unified, offering a seamless flow of services, serve as one stop window for governmental services, and offering the personalized services with political commitment, are regarded as the most advanced form of e-governance offered by the governments. As the 'Nagarik App' is claimed to be the one-stop serving window that merged (aims to merge) all the services, promises to provide seamless service, this app can be classified and categorized at different stages of e-government. As per the criteria set by the different scholars and promises made by this app regarding the service to be rendered, the app could be classified at different stages:

- Being based on the criteria by UN's 5 stage e-government development model, 'Nagarik App' could be classified at the 'interactive presence stage' as it offers services to 'connect service providers and users for the task to happen in a sophisticated way'.
- When analyzing 'Nagarik App' based on the classification made by (Karen & Jungwoo, 2001), this app could be classified at the 'transaction+' stage. As the app offers online transactions and integrates some of the governmental functions and services. Thus, the current status of this app is above the 'transaction stage' and not fully qualified to reach the 'vertical integration stage'.
- If we analyze the stage of 'Nagarik App' based on the criteria proposed by (Hiller & Belanger, 2001), it falls under the 'service and financial transaction' stage. As this app offers services that enable and facilitate transactions between the government and citizens as well as the business. And in the near future, it can be expected that it app will be upgraded into the 'Vertical and horizontal integration' stage as the app is aimed at the integration of services from the different hierarchical levels and departments of governments.

2.2.3 Nepal and E-government

When it comes to Nepal's e-government endeavors, the earliest attempt can be traced back in 1970s. For the first time, Nepal used a computer (IBM 1401) to calculate census data. (Pariyar, 2007) summarized Nepal's initiatives in this regard as follows:

Table 1: Nepal's Initiatives in Regards to ICT Development

Year	Initiatives
1972	Introduction of computer for the census (IBM1401)
1974	Establishment of Electronic Data Processing Center
1982	First Private Overseas Investment in software development by establishing company for export, Data Systems International (p) LTD
1985	Distribution of Personal Computers
1990	Liberalization on imports of equipment
1992	Establishment of Computer Association of Nepal
1996	Establishment of the Ministry of Science & Technology
2000	Announcement of the first IT policy, "IT Policy 2000"
2001	Establishment of National Information Technology Center
2003	Establishment of High Level Commission for Information Technology
2007	Enactment of Electronics Transaction Act

Source: (Pariyar, 2007)

(Kim, Pokharel, & Lee, 2007) have classified Nepal's ICT development into four phases:

Table 2: Nepal's ICT and E-government Development Timeline

Phase	Initiatives:
First: 1970-80: Active period	<ul style="list-style-type: none"> • First ever computer in Nepal; IBM 1401 was introduced for census data processing. • National Computer Center(NCC) was established
Second: 1980-1990: passive period	<ul style="list-style-type: none"> • Software development activities • Invitation to international companies
Three: 1990-2000: development period	<ul style="list-style-type: none"> • Computer Association of Nepal • IT park • Private university graduates on ICT
Four: 2000- Emerging period	<ul style="list-style-type: none"> • Different IT policies • Goal setting and vision formation

Source: (Kim, Pokharel, & Lee, 2007)

All government departments have their own websites; however they are not fully operational and up to date. They offer very basic information on their vision, mission, purposes, and citizen charter. Almost all of the work in the public sector is done in a hybrid method; online and offline on paper. Many people fear that database online may be distorted or skewed. Also they have the fear that as a result of inferior security measures, there exists future potential hacking threats.

21 federal ministries, 13 constitutional organizations, 28 federal departments and their

field offices, 7 province governments and their agencies, and 753 local levels, all have their own websites. And majority of them also have own distinct mobile applications. Even ward-level offices use social media platforms linked to the municipal administration to communicate information and provide services to citizens. Despite the digital divide, fragmented efforts from different agencies, and several challenges, e-government services in Nepal have already created a wider web of service delivery and have a great impact on the style and way the governments at different level operate. To cope with the emerging challenges and to integrate the data across the governmental agencies, National Information Technology Center (NITC) was established (National Information Technology Center , 2022).

This online approach has decreased the time it takes to find records and information in the archive while also adding some more effort due to duplication. The work that was previously done solely on paper is now needed to be entered into the online database system alongside the offline paper tasks. As a result, additional human resources, infrastructure, technology, and technological know-how became fundamental necessities. Service seekers, on the other hand, felt that government agencies imposed unnecessary and excessive burden on them, and speedy service delivery has been slowed down. Even in the countries like Denmark where the e-government development index is comparatively higher, challenges regarding e-government-related ICT projects exist. Public servants reluctant to value the importance of management skills coupled with inadequate competencies and skills were the reasons behind the negative impacts on ‘benefit realization’ and are the cause for the failure of the e-government projects in the public sector (OECD, 2010).

Despite the incessant efforts from the government of Nepal, Nepal’s position in e-

government development index is not satisfactory as it is ranked below the world average and sub-regional average. The following chart illustrates Nepal's position on e-government development index which is measured by using three dimensions (UN E-Government Knowledgebase, 2022): Provision of online services, Telecommunication connectivity and Human capacity.

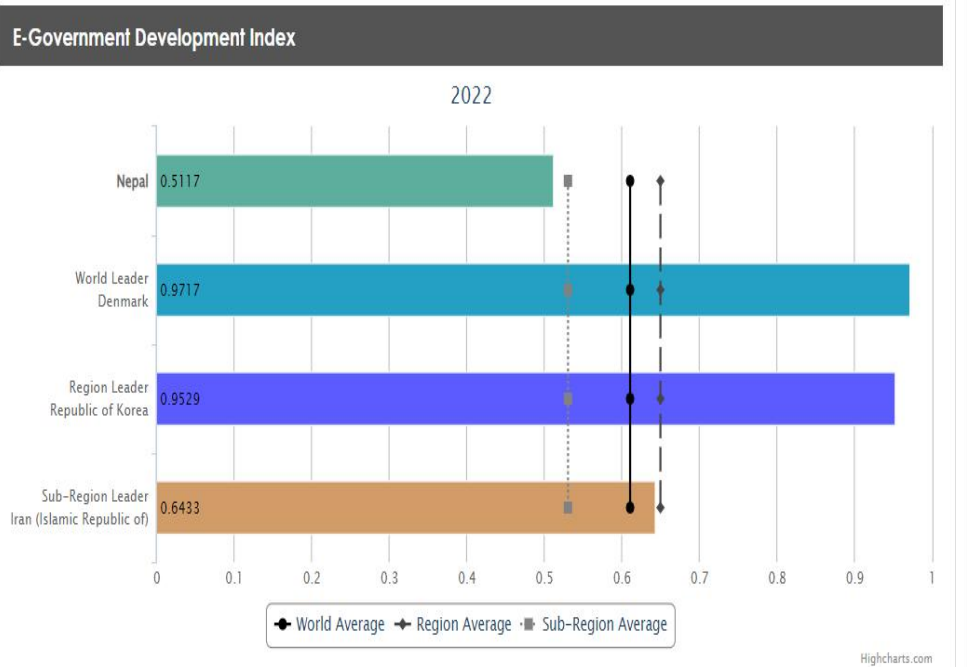


Figure 6: Nepal's position in e-government development index

Source (UN E-Government Knowledgebase, 2022)

Comparison among Nepal and South Asian Countries in e-governance development index

Table 3: South Asia and E-Governance Development Index

Country	Position	value	remarks
Sri Lanka	95	0.62850	Leader in South Asia
Maldives	104	0.58850	
India	105	0.58830	
Bangladesh	111	0.56300	
Bhutan	115	0.55210	
Nepal	125	0.51170	Third from the last in South Asia
Pakistan	150	0.42380	
Afghanistan	184	0.27100	
Asia regional average		0.6493	
South Asia sub-regional average		0.5300	

Source (UN E-Government Knowledgebase, 2022)

2.2.4 Challenges in E-government service in Nepal

E-governance is increasingly being emphasized as a tool for governance in emerging Asian and Pacific states to achieve good governance. E-governance, when correctly

implemented, not only increases the efficiency of governmental functions but also allows citizens to engage in improved and participatory democracy by allowing individuals to participate in policy-level decision-making processes of government organizations. (LH, 2005). Achieving the main goal of introducing e-government itself is the major challenge in every corner of the world. Governments are struggling to deliver “*faster, better, cheaper and higher-quality services*” to citizens (Alvani & Riahi, 2003). Meeting the expectations of the people from the service to be delivered is regarded as a major challenge of ICT led e-governance. ‘Service gap theory’ proposed by (Parasuraman, Zeithaml, & Berry, 1985), states that the difference between the expectations of the customers and their perception regarding the delivered services could be understood as the service quality. Maintaining service quality as per the expectations of the people is one of the major challenges.

(Heeks & Bailur, 2007) found serious results regarding the implementation failure of e-government projects in developing countries where 35 percent of the projects are classified as complete failure and 50 percent of the programs are categorized as partially failed projects. There are several reasons behind this dismal failure of e-government projects in developing countries. According to (Pina, Torres, & Acerete, 2007), the main reasons that have significant and determining effects on the e-government projects making them unable to realize the desired results are; social, economic, and political in nature.

Problems in developing countries are more serious than in developed countries in terms of e-service delivery. Human capital is regarded as the driver and distributor of civil service and making it productive, technically proficient, accountable, and innovative; having a positive attitude, excellent manners, and modern adaptability are the challenge

and opportunity at the same time in the changing context (RegmiDamodar, 2008).

Introducing online services into the government service delivery along with the paperwork has some unwanted negative effects on the speed of the service delivery in Nepal because of the challenges related to ‘infrastructure development, human resource development, and management and digital divide’ as major issues (Giri, Shakya, & Pande, 2018). The writers further identified Government services are delayed by middlemen and syndicates of hidden interests groups, multilayer decision-making process, process-oriented (rather than result-oriented) service delivery, pushing the bucket culture, and a lack of decentralization are the challenges to the development of e-service quality in Nepal. In his paper (Shailendra, 2019) identified several problems regarding ICT-led e-governance in Nepal at different levels of implementation; inadequate infrastructure, insufficient public policies and legal provisions, lack of well-trained human resources, digital divide and lack of e-literacy are coupled with the problems which are political in nature, little public awareness, low per capita income and emerging and changing nature of technology. Political issues, socio-economic issues, and digital divide, were discussed by (Shakya, 2018) as the major challenges in Nepali e-governance. E-government is not a panacea for all the problems that the public service sector is facing today. For the better, improved, and seamless flow of public service to be provided by the government, e-service is a precondition and at the same time, it demands updated infrastructure, and well-trained human capital among others.

After analyzing the literature, e-governance in Nepal is found to be facing several challenges in the following sectors:

- E-governance-related infrastructure development
- Recruiting and developing well-equipped human capital
- Addressing legal issues

- Political commitment
- Increasing e-literacy and e-awareness
- Addressing digital divide
- Incorporating and adapting to change

Despite the several challenges, e-governance in Nepal poses great potential in e-governance and excessive use of mobile phones indicate the readiness and “huge potential for m-governance (mobile governance)” (Shakya, 2018).

2.2.5 E-Service quality

E-service quality was mainly focused on e-commerce-related mobile applications in private sectors for repeated purchases from the customer and for customer loyalty. But in the governmental sector, e-service quality aspect of applications are seen to be paid lesser attention (Santos J. , 2003) which is one of the major reasons to lead 35% of the e-governmental programs in developing countries to a complete failure and 50% to partial failure (Heeks & Bailur, 2007) (Al-shehry, 2008). Service quality is an important factor and if paid no attention, will lead to the overall failure of the project in e-commerce and it can involve customers in the modifications of products and production procedures seeking feedback from them (Santos J. , 2003). Despite being a new sector to be explored, the absence of electronic service quality will lead a program to become a futile one (Lee & Lin, 2005) (Li & Reima, 2009). Many of the e-government services are designed and developed with lesser attention to the necessity of citizens and quality of service (Chutimaskul, Suree, & Vithida, 2008). And, (Zeithaml, 2002) argues that key characteristics such as reliability, simplicity, easiness, and security become the imperative factors to be included in e-governance services.

E-service quality has its roots back to *Ananthanarayanan Parasuraman's* concept of SERVQUAL (Valarie, Parasuraman, & Malhotra, 2000). SERVQUAL is composed of 7 constructs viz. “*efficiency, reliability, fulfillment, privacy, responsiveness, compensation, and contact.*” Different studies have included various factors under e-service quality in various contexts.

(Barnes & Vidgen, 2001) used five constructs of e-service quality viz. ‘*Tangibles, reliability, responsiveness, assurance and empathy*’ while analyzing the quality of websites and online trade. While analyzing the service quality of online shopping, (Bauer, Falk, & Hammerschmidt, 2006), used five dimensions; ‘*Responsiveness, reliability, process, functionality/design, and enjoyment*’. A comprehensive list of measures; “*Information quality, tailored communications, trust, response time, ease of understanding, intuitive operations, visual appeal, innovativeness, emotional appeal, consistent image, online completeness, relative advantage*” was used by (Loiacono, Richard, & Dale, 2002) when they analyze the quality of websites. Four dimensions; *Fulfillment/reliability, website design, privacy/security, and customer service* were explored by (Wolfenbarger & Gilly, 2003) in the context of customer service quality of e-retailers. “*Ease of use, aesthetic design, processing speed, security of personal and financial information*” were the constructs identified for the study of website quality by (Yoo & Donthu, 2001). While studying service quality related to ‘*business to commerce*’, (Valarie, Parasuraman, & Malhotra, 2000), explored “*Information availability and content, ease of use or usability, privacy/security, graphic style, reliability/fulfillment.*”

The table below lists the measures and constructs of e-service quality in previous literature:

Table 4: Measures of E-Service Quality in Previous Studies

Study	Context	Measures/constructs
(Barnes & Vidgen, 2001)	Website quality and online trade	Tangibles, reliability, responsiveness, assurance, empathy
(Bauer, Falk, & Hammerschmidt, 2006)	Customer's service quality of online shopping	Responsiveness, reliability, process, functionality/design, enjoyment
(Loiacono, Richard, & Dale, 2002)	Website quality of website usage	Information quality, tailored communications, trust, response time, ease of understanding, intuitive operations, visual appeal, innovativeness, emotional appeal, consistent image, online completeness, relative advantage
(Wolfenbarger & Gilly, 2003)	Website quality and customer's service quality of e-retailer	Fulfillment/reliability, website design, privacy/security, customer service
(Yoo & Donthu, 2001)	Website quality of website usage	Ease of use, aesthetic design, processing speed, security of personal and financial information
(Valarie, Parasuraman, & Malhotra, 2000)	E-service quality of B2C commerce	Information availability and content, ease of use or usability, privacy/security, graphic style, reliability/fulfillment

Source: (Yen & Hsi-Peng, 2008)

After reviewing the previous literatures (Alanezi, Ahmad, & Shuib, 2011) proposed a model with eleven dimensions of e-government e-service quality that affect user satisfaction and trust; *'1)efficiency, 2) system availability, 3)privacy, 4)fulfillment, 5)interactivity, 6)personalization, 7)format, 8)information, 9)responsiveness, 10)contact, and 11)process time'*.

After analyzing the measures that are used in the previous literature, this study will use six measures of e-service quality: 1) efficiency, 2) system availability, 3) privacy, 4) fulfillment, 5) responsiveness, and 6) contact.

2.2.6 Previous studies

Studies conducted in relation to service quality and user satisfaction displayed mixed results. Some of the studies showed service quality having strong effect over user satisfaction, whereas some of them did not.

Table 5: Results of Previous Studies on E-Service Quality and User Satisfaction

Research work	Context of study	Study results(supported: Y, Not supported: N, Mixed: M)
(Halawi, MCCarthy, & Aronson, 2007)	Knowledge management	Y
(Leclercq, 2007)	Users and Information system function	Y
(Shaw, Delone, & Niederman, 2002)	Support services for University	Y
(Yoon, Guimaraes, A, & Q, 1995)	Technical performance from developer	Y
(Kettinger & Lee, 1994)	University's computer support services	Y
(LEONARD-BARTON & SINHA, 1993)	Developer's technical performance	M
(DEVARAJ, FAN, & KOHLI, 2002)	Web setting	N
(CHIU, CHIU, & CHANG, 2007)	E-learning environment	N
(Marble, 2003)	Implementation of IS project	N
(ALADWANI, 2002)	Government Internal support	N
(Palmer, 2002)	Study of web sites	N
(Choe, 1996)	IS personnel in accounting IS	N

Source: (Petter, DeLone, & McLean, 2008)

(Sausi, Mtebe, & Mbelwa, 2021) conducted study on 442 users of e-payment gateway system and their satisfaction in Tanzania and concluded that 3 dimensions; ‘Trust in system, information quality, and perceived usefulness’ had significant positive impact, another construct ‘service quality’ had a negative and ‘system quality’ did not have any effect. A study conducted by (Kafaji, 2013) with 208 internal respondents in Saudi Arabia; found that system quality and information quality have effects on user satisfaction where e-service quality is found to play a strong mediator role between satisfaction and other two dimensions; system quality and information quality in governmental applications. (Sachan, Kumar, & Kumar, 2018) studied electronic government service delivery system (eGSDS) with 197 respondents and concluded that technological capabilities applied in governmental websites are the vital factors to influence service quality and satisfaction level of the users. (Kim, Eom, & Ahn, 2005) used three factors; ‘*confirmation/disconfirmation, perception-only, and overall assessment*’ to measure the service quality and its relationship with user satisfaction and concluded that managers have to pay attention to service quality to increase user satisfaction. (Michel & Cocula, 2017) studied system quality, service quality, and information quality and their relationship with satisfaction in the banking sector which is a highly information-intensive sector, and concluded that system and service quality have a remarkable influence on information quality and the latter has a significant influence on user satisfaction. (Baharon, Yap, Ashar, Hanafi, & Hazmi, 2017) tested four dimensions of the Malaysian e-governmental portal; “*perceived ease of use, citizen trust, service quality, and content quality*” with 111 respondents and found that service except for citizen trust, all the constructs are directly related to users’ satisfaction. (Wicaksono, Tjen, & Indriani, 2021) explored taxpayers’ opinions in Indonesia and found that taxpayers wanted reform in dissemination (related to service quality) among others.

With 389 respondents (Pinem, Immanuella, & Hidayanto, 2018) found that service quality is one of the major factors contributing users' trust and continuation with the government-to-business services in Indonesia. Online survey conducted on a survey portal of Nepal Telecom displayed the result that 'Online service quality and information quality' were found to have the major determining effects on user satisfaction and 'sustainability of e-commerce technology' in Nepal (Sharma & Lijuan, 2015). A study conducted by (Manandhar, Kim, & Hwang, 2015) on the factors that contribute to the success of online service in Kathmandu metropolitan showed that information quality and service quality have a significant influence on the success of online service at the same time they serve as the barriers to the service and system quality is strongly related to intention to use. A study conducted on citizen satisfaction from e-government services in Afghanistan showed that citizen satisfaction is affected by the availability of services and other factors; "Paralinguistic assistance, process performance, skill gaps, awareness, citizen-centric features, information security, and transaction security" (Anwer, Esichaikul, & Anjum, 2016). A study conducted by (Dabas & bajaj, 2019) on the 400 respondents showed that dimensions of e-service quality have a strong impact on user satisfaction in online baking in India.

2.2.7 Critical review

Though, supported by bilateral and multilateral development partners and, despite its own regular efforts, e-government initiatives in Nepal are yet to gain momentum. It is clear from the previous studies that developed countries have higher engagement with e-government practices and developing countries are the spectators unsuccessfully trying to follow them from far behind. Literature, from the first world, shows higher civic

engagement and higher user satisfaction, and significant ICT-mediated interaction between and among the citizens, governments, and related institutions. On the other hand, the developing world, having very little literature (compared to the developed world), depicts the dismal picture of ICT-led governmental projects. However, the e-governance –related projects paid more attention to the constructs of e-service quality are proved to be fruitful for both; developed and developing world. It clearly shows that ICT-based projects can work in tandem with developmental works in developing countries for better delivery. Nepal, a country ranked at 125th position worldwide, based on the e-government development index, has very little literatures regarding e-government and ICT-based initiatives. So far, the studies are seen to be developed with a holistic and machine-gun approach to study the whole e-government without specializing and segregating its components and constructs. To date, in the context of Nepal, researcher is familiar to the research works measuring user satisfaction, related with mobile-application especially in telecom, banks, online shopping and payments, distance learning, and telemedicine sectors. There is a distinct scarcity of literature dealing with governmental mobile application-derived user satisfaction, particularly from the perspective of e-service quality. As a result, the literatures are inadequate in terms of quantity, and they are less targeted, ambiguous, and confusing, and directed by a 'one size fits all' approach. As a result, there dire need of a clear, focused, thorough, and specialized examination of each component, particularly the e-service quality element of mobile-based e-government service in the Nepalese context.

2.2.8 Research gap

E-service quality aspect of the e-government project has a greater say in shaping the satisfaction level of the users. And this satisfaction level of people significantly affects the success or the failure of the project. This specific aspect has to be paid more attention

while developing mobile-based e-government applications. Very limited literatures have been found, especially in the Nepalese context, on e-service quality and its impact on user satisfaction in mobile application-based governmental services. To fulfill the research gap in the e-service quality factor of e-government project based application, this study has been proposed.

Chapter 3: Research Design and Methodology

3.1 Research Design

This study is a quantitative, non-experimental, explanatory, co-relational, and cross-sectional survey research that aims to examine the correlation between the constructs of e-service quality of 'Nagarik App' (independent variable) to user satisfaction (dependent variable).

This study is based on the quantitative method of data collection and description

3.2 Analytical framework

Being based on (Parasuraman, Valarie, & Arvind, 2005), (Alanezi, Ahmad, & Shuib, 2011) and (DeLoneWilliam & EphraimR., 2003), this paper will use the following framework for the study:

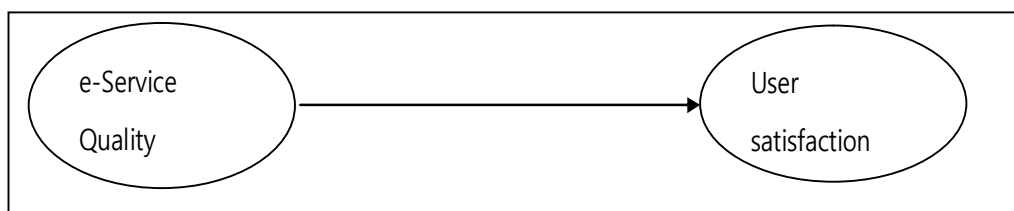


Figure 7: Analytical Framework for This Study

3.3 Research Model

Being based on theoretical analysis, the following model is proposed for the study, which will investigate the effects of e-service quality on the user satisfaction. According to the proposed model, different constructs of the e-service quality of mobile applications will

be measured in relation to user satisfaction.

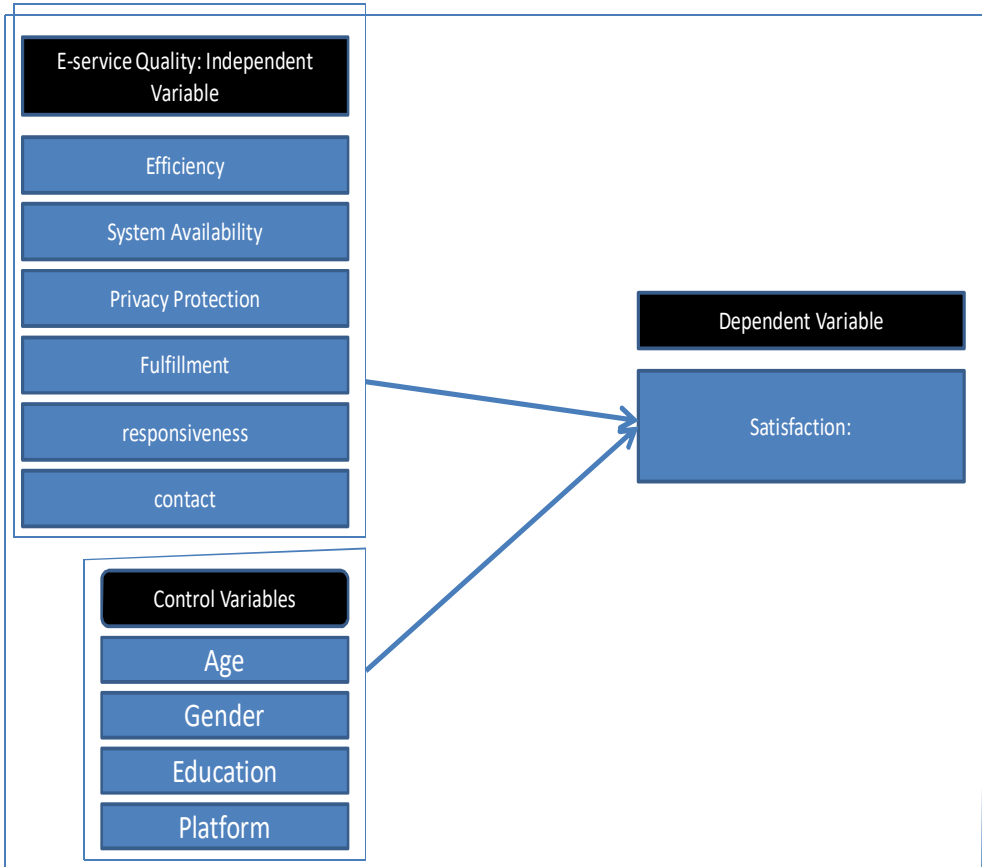


Figure 8: Research Model for Study

Being based on the research model above, a multiple linear regression model was proposed as below:

$$\text{Satisfaction} = \beta_0 + \beta_1 * \text{efficiency} + \beta_2 * \text{system availability} + \beta_3 * \text{privacy} + \beta_4 * \text{fulfillment} + \beta_5 * \text{responsiveness} + \beta_6 * \text{contact} + \beta_7 * \text{age} + \beta_8 * \text{gender} + \beta_9 * \text{education} + \beta_{10} * \text{platform of use} + e$$

Here,

β_0 = intercept of regression line

β_1 = regression coefficient of efficiency

β_2 = regression coefficient of system availability

β_3 = regression coefficient of privacy protection

β_4 = regression coefficient of fulfillment

β_5 = regression coefficient of responsiveness

β_6 = regression coefficient of contact

β_7 = regression coefficient of age

β_8 = regression coefficient of gender

β_9 = regression coefficient of education

β_{10} = regression coefficient of platform of use

e = error in regression

3.4 Research Hypothesis

After reviewing the previous literatures in e-service quality and user satisfaction the following hypotheses are synthesized:

Efficiency and user satisfaction:

This factor shows the degree of usability and accessibility of the e-government services. Since one of the primary goals of the government to run websites or mobile applications is to provide quick and easy access to government information, efficiency plays a significant role in this regard to accomplish this goal.

Efficiency is the degree of easiness and accessibility of the application (Parasuraman,

Valarie, & Arvind, 2005). That means an application, that is simple, has well-organized information, is easy and convenient, and productive to use, could be classified as the application that has efficiency. The developer (application owner) has to develop an efficient technology as this element; efficiency is the key factor in this platform (Bauer, Falk, & Hammerschmidt, 2006). Two major incentives for users to use online services are; to save time and enjoy the convenient service (Kim, Jung-Hwan, & Sharron J., 2006). The complexity of the materials and difficulty in understanding the content, slow downloading process will negatively affect users' perceptions. 'Easiness in usage' is found by (Yoo & Donthu, 2001) as the most significant factor that has a greater influence on user satisfaction. It is crucial for e-government services (websites) to be well-organized, navigable, and well-structured that help customers to discover what they need without being lost or confused (Jun, Liangliang, & Fubin, 2009).

Based on the previous studies, the following hypothesis is synthesized for this study:

H1. Efficiency of the 'Nagarik App' positively influences user satisfaction in Nepal.

System availability and user satisfaction

System availability means the 'correct technical functionality' of e-government applications (Parasuraman, Valarie, & Arvind, 2005). It is related to a technical dimension which ensures that the technical functions are up to date and working in an accurate manner and this will ultimately lead to user satisfaction and desired productivity from the online services (websites) (Kim, Jung-Hwan, & Sharron J., 2006). Stable data transmission and taking minimum time for accurate online processing are examined

under availability (Bauer, Falk, & Hammerschmidt, 2006). It has different dimensions; accessibility of application all the time, launch and operation on time when required and hassle-free continuity while using without freezing or crashing. System availability guarantees that the e-government website is accessible to citizens at all times, enabling the initiative to meet its goal of providing services to residents, day and night, seven days a week (Obi, 2009).

After analyzing the previous literature, the following hypothesis is proposed:

H2. System availability of the 'Nagarik App' positively influences user satisfaction in Nepal.

Privacy and user satisfaction

Privacy is the concern of the users to what extent the application is safe to use and protects users' information during and after using it (A. Parasuraman, 2005). Main concern of this construct is security features to protect personal information and transaction history making sure that the data generated is not a subject to be shared with third party but to protect it from the unauthorized access. E-service customers want to check whether there is a declaration that the personal information that is going to be generated while using the e-service platform (website) is not going to be disclosed or shared (Obi, 2009). The service provider should give the confidence to the users that their data and transaction history will not be disclosed or will not be accessed by unauthorized party. Failing to do so will directly affect the satisfaction of the users negatively. One of the major hurdles in developing an online environment, as discussed by (Cristobal, Flavian, & Guinaliu, 2007), is the lack of confidence arising from inadequate security and privacy in online platforms.

Therefore, the following hypothesis is developed:

H3. Privacy of the 'Nagarik App' positively influences user satisfaction in Nepal.

Fulfillment and user satisfaction

It is the process of matching the promises of service providers about their service delivery and actual availability of the services while using the application by users (A. Parasuraman, 2005). This is the most important factor of e-services that 'should' be emphasized for better service quality (Kim, Jung-Hwan, & Sharron J., 2006). To increase the satisfaction level of the user, e-government service platforms need to provide the services at promised time. It can be regarded as a condition where a service or task promised by the government to be provided is performed or provided within the stipulated time within or from the e-government platform. This encompasses of delivery of the promised service at right time, with 'correct charges of tax'. Fulfillment is a condition when a user downloads an application and gets what actually has been described and displayed (Bauer, Falk, & Hammerschmidt, 2006). If the e-government platforms do not perform the promised task at designated time, it will increase dissatisfaction in the users' side which will ultimately lead to the discrediting of the e-government sites (Yang & Fang, 2004).

H4. Fulfillment of the 'Nagarik App' positively influences user satisfaction in Nepal.

Responsiveness and user satisfaction

Responsiveness is related to the promptness of the e-government platforms to effectively handle the queries from the service seekers and readiness to address the problems. In their study, (Lin & Lee, 2005), claimed that responsiveness and users' satisfaction are strongly co-related. This is the service provider's responsibility and capacity to respond to the users, sometimes even after the completed transaction to build good customer relationship (Yen & Hsi-Peng, 2008). It examines how effectively the service provider handles the problems faced by the users (Parasuraman, Valarie, & Arvind, 2005). It can be better known as a prompt reaction of the service providers to the requests, problems, and difficulties faced by the customers. Service seekers have the expectation that the service provider will respond their queries on time (Yang & Jun, 2002).

Thus, the following hypothesis is formulated:

H5. Responsiveness of the 'Nagarik App' positively influences user satisfaction in Nepal.

Contact

Contact is readily available assistance to the application user. It is a process being available for the queries from the users and satisfying them with assistance. It could be done by telephone or any other means of communication and online responders. Immediately after the user downloads the application, there should be an easier contact channel with the developer/provider (Parasuraman, Valarie, & Arvind, 2005). Providing a direct communication channel with ready responder, so that service seekers can contact and ask for help immediately so the problem could be understood by the responder and solved on an accrual basis. This is significant for users' satisfaction. Offering help to online users significantly improves the satisfaction level of the users (Kim, Jung-Hwan,

& Sharron J., 2006).

Analyzing the previous literatures, the following hypothesis is formulated:

H6. Contact of the 'Nagarik App' positively influences user satisfaction in Nepal.

3.4.1 Conceptualization and Operationalization

For this study, independent variables; efficiency, system availability, privacy, fulfillment, responsiveness, and contact and dependent variable satisfaction are defined as follows:

Table 6: Operational Definition of The Constructs

Constructs	Operational definition	Source
Efficiency	The convenient and quick access to the app and its services	(Kim, Jung-Hwan, & Sharron J., 2006) (Parasuraman, Valarie, & Arvind, 2005) (Bauer, Falk, & Hammerschmidt, 2006). (Alanezi, Ahmad, & Shuib, 2011)
System availability	The launch and correct technical operation without operational failure	
Privacy	The security features to protect users' data	
Fulfillment	The requested task accomplishment as promised by application	
Responsiveness	Effective handling of problems and refunds	(Parasuraman, Valarie, & Arvind, 2005). (Yen & Hsi-Peng, 2008). (Alanezi, Ahmad, & Shuib, 2011)
Contact	The easily available assistance online from the developer	(Parasuraman, Valarie, & Arvind, 2005) (Alanezi, Ahmad, & Shuib, 2011)

User Satisfaction	pleasurable experience of using 'Nagarik App' with intention of continuance of using	(Doll, Weidong, & Gholamreza, 1994), (Bhattacharjee, Perols, & Sanford, 2008), (OliverRichard, 1980), (WestbrookRobert & OliverRichard, 1991) (ManoHaim & OliverRichard, 1993), (BeardenWilliam & TeelJesse, 1983)
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3.5 Construct and measures

Every construct and their measures were developed after a comprehensive review of the previous literature.

The constructs of e-service quality were developed and applied in various studies in different settings. Measures in this study were mainly based on the E-S-QUAL and E-RecS-QUAL measures of (Parasuraman, Valarie, & Arvind, 2005). And the measures were customized to fit the context of mobile application-based services offered by the government as the service provider.

Table 7: Measurement of The Constructs

Constructs	code	Measurement
Efficiency	EF1	'Nagarik App' is simple to use.
	EF2	'Nagarik App' is well organized.
	EF3	Inside 'Nagarik App' I can easily find what I need
	EF4	'Nagarik App' is convenient
System availability	SA1	'Nagarik App' is always available with services
	SA2	'Nagarik App' launches and runs right away
	SA3	'Nagarik App' does not freeze after I request for service
	SA4	'Nagarik App' does not crash
Privacy	PR1	'Nagarik App' has adequate security features.
	PR2	'Nagarik App' does not share my personal information with others
	PR3	'Nagarik App' protects my personal information from unauthorized access.
	PR4	'Nagarik App' protects information about my transactions (pin/security code)

Fulfillment	FU1	I get the service that I request for
	FU2	'Nagarik App' is truthful about its offerings
	FU3	'Nagarik App' provides services as promised
	FU4	'Nagarik App' satisfies its purpose
Responsiveness	RE1	'Nagarik App' offers promptness of reaction to requests.
	RE2	'Nagarik App' advises me the solutions for the transactions that are not processed
	RE3	'Nagarik App' solves problems promptly
	RE4	'Nagarik App' handles refund requests in a proper way
Contact	CO1	The governmental channel is designated and available to contact
	CO2	Service representatives are available online
	CO3	There is no difficulty to communicate with the agency
	CO4	I can contact the agency using "Nagarik App"
Satisfaction	Satis1	I am satisfied from the e-services of 'Nagarik App'
	Satis2	E-services of 'Nagarik App' meet my expectation
	Satis3	I will continue to use 'Nagarik App'
	Satis4	I recommend people to use 'Nagarik App'

3.6 Sampling and Data Collection method

3.6.1 Population

The study will be conducted all over Nepal. The entire Nepali citizens who are using 'Nagarik App' will be the eligible respondents. According to the (Nagarik app, 2022), there are 800,000 Nepali citizens using 'Nagarik App'. The population of this study is the entire Nepali citizens using 'Nagarik App'.

3.6.2 Sampling frame and size

The minimum anticipated sample size for the study is determined as per the calculations prescribed by (KREJCIE & MORGAN, 1970) is 385. Similarly, Raosoft (Raosoft, 2004) online sample calculator also suggested 384 as the minimum sample size for this study. To determine the sample, multistage cluster sampling method was employed. As the researcher does not have the entire list of the people who are using 'Nagarik App', researcher randomly selected 750 potential respondents who are active on social media platform i.e. Facebook, and sent them the questionnaire.

3.6.3 Survey instrument

Google form based online survey questionnaire was developed to collect the opinions from 'Nagarik App' users. Four questions were asked for every construct of the study. The questionnaire consists of 28 items related with dependent and independent variables and four questions were related with demographic details of the respondents. Questions were developed after analyzing previous studies and modified to fit the context. Primary data was collected from a single set of Google-form based questionnaire comprised of 32 questions. Five-point Likert scale (1=strongly disagree, 2= disagree, 3=Neutral, 4=agree, 5=strongly agree) was used to record the opinion of the respondents. Google form feature 'limit to 1 response' was turned on to avoid multiple responses, which required respondents to log in to their Google account to respond. Filtering question was used at the beginning of the questionnaire to avoid the responses from the non-users of 'Nagarik App'. The questionnaire was developed in English and then translated into Nepali language with assistance of a notary public officer (advocate) and a renowned Nepali language professor from Tribhuwan University Nepal. Questionnaire employed to collect

the required data is annexed in annexure 1.

3.6.4 Data collection

This study used Google-based online survey questionnaire to collect primary data. A single set of questionnaire was sent to the randomly selected 750 potential respondents who were using the social media platform; Facebook. Data collection started from September 29, 2022 and closed on 20th October, 2022. All together, 502 responses were recorded. 70 (13.9%) out of them filtered out by the filtering question as they were not using 'Nagarik App'. Only 432 (86.1%) respondents said they are using 'Nagarik App' and completely participated in the entire survey and successfully registered their opinion. Automatically generated Google sheet was downloaded as an excel file and analyzed using SAS software. Anonymity of the responses was maintained and only the average values of the responses were used for data analysis purposes.

3.6.5 Data Analysis Method

The SAS software (SAS Institute Inc., 2021) was employed to perform required statistical tests and analyze the relationship between dependent and independent variables viz. e-service quality measures and user satisfaction. For statistical analysis (Creswell, 2009) prescribed various statistical measures; “*mean, median, mode, maximum, minimum, range, quartiles, inter-quartile range, variance, and standard deviation*” which are widely used while performing descriptive analysis. In order to test the hypothesis of the study, the measures of correlation, regression analysis, t-test, and ANOVA test were performed in SAS software.

To examine the relationship between independent variables; e-service quality measures

(efficiency, system availability, privacy, fulfillment, responsiveness and contact) and dependent variable (users' satisfaction) controlling with education, gender, age and platform of use, multiple linear regression model was employed. 95% of the confidence level was assumed to test the statistical significance of the acquired p-value.

Calculation from the SAS showed that the model fits for multiple linear regression. In the model, R-square explains the "*coefficient of determination which indicates the percentage of variation in dependent variable*" (user satisfaction) by independent variables (e-service quality) and control variables. And the adjusted R-square is the "*corrected goodness*" of fitness of the linear model (Creswell, 2009).

Chapter 4: Presentation, Analysis, and Discussion of Results

The results of the data obtained from the online Google survey are presented and discussed in this chapter. This chapter deals with the descriptive presentation of statistics related to e-service quality of 'Nagarik App' and users' satisfaction with added control variables; age, gender, education level, and platform of use. The statistical analysis, Pearson correlation, and multiple linear regression, which were used to test the proposed hypotheses, are also presented.

4.1 Descriptive statistics

4.1.1 Descriptive statistics of survey respondents

Online Google-form-based survey questionnaire was sent to 750 potential respondents, out of them 502 respondents have responded. Response rate is 66.93% which is highly acceptable. Out of the responses, 70 people said that they were not using 'Nagarik App' and were automatically filtered out by Google form. They were not permitted to complete the entire questionnaire. The remaining 432 respondents completed the whole set of questionnaires. As a result, the final sample for the study consisted of 432 Nepali citizens who were using 'Nagarik App' during the time of response.

There are 83 (19.2%) respondents between 16 and 25 years of their age, the majority of them are between 26 and 35, with 216 (50%), and 91 (21.07%) respondents are from age group of 36-45 years. There are 32 responders from the age category 46-55, and just 10 (2.31%) from the age group 56 and above.

By education level, the majority of the respondents have completed a master's degree or above, accounting for 205 (47.45%), followed by the bachelor's degree graduates 152 (35.19%). 47 responders (10.88%) have completed their +2/proficiency certificate (Higher school/10+2). Only 20 (4.63%) of responders completed their SEE/SLC level, while the remaining 8 (1.85%) are below SEE/SLC.

Regarding the gender composition of the respondents, the majority of responses are received from males 351 (81.25%), and for the female 81 (18.75%) responses are recorded.

As per the platform of use, responses are dominated by android platform users with 361 (83.56%) while apple platform users accounted for 71 (16.44%).

Table 8: Descriptive Statistics of The Survey Respondents

Variable	Level	Frequency	Percent
Age	16-25	83	19.21
	26-35	216	50.00
	36-45	91	21.07
	46-55	32	7.41
	56+	10	2.31
	Total	432	100
Education level	below SEE/SLC	8	1.85
	SSE/SLC	20	4.63
	+2/proficiency level	47	10.88
	Bachelor's degree	152	35.19
	Master's or above	205	47.45
	Total	432	100
Gender	male	351	81.25
	female	81	18.75
	Total	432	100
Platform	Apple	71	16.44
	Android	361	83.56
	Total	432	100

4.1.2 Reliability and validity of the survey instrument

The Cronbach alpha (coefficient alpha) for the survey instrument used in this survey has been measured and evaluated and the value was over 0.93, which indicates that this instrument is valid and reliable to test the e-service quality and user satisfaction.

4.1.3 Descriptive statistics of independent variables

The table below presents descriptive statistics of independent variables (efficiency, system availability, privacy, fulfillment, responsiveness, and contact);

The overall mean score for efficiency is 3.93 (SD = 0.74). Similarly, system availability has an overall mean score of 3.11 (SD =0.1.03). The mean score for privacy is 3.13 (SD=0.93). Fulfillment has 3.67 (SD=0.83) as the mean score. The Overall mean for responsiveness is 3.35 (SD= 0.92). The Lowest mean score is recorded for contact which is 2.76 (SD=0.98). Independent variable efficiency has the highest mean score followed by fulfillment and responsiveness.

Table 9: Descriptive Statistics of Independent Variable

(N=432)

Construct	N	Mean	SD	Min	Max
efficiency	432	3.932	0.743	1	5
system availability	432	3.113	1.031	1	5
privacy	432	3.130	0.932	1	5
fulfillment	432	3.674	0.838	1	5
responsiveness	432	3.359	0.926	1	5
contact	432	2.764	0.984	1	5

4.1.4 Demographic comparison of efficiency

For efficiency (overall mean score=3.93, sd=0.74), one of the independent variables, distribution of responses is categorized, in the table below, being based on the demographic component.

Regarding age category, the people aged between 36 to 45 years are seen to have more positive opinions regarding efficiency. The mean score for this group is 4.15 (sd=0.62) followed by the age group 16-25 with a mean score of 3.98 (sd=0.70). The score for these two groups is above the overall mean score, i.e. 3.93. Users from the age group 26-35 and 46-55 shared a similar type of opinion having mean score of 3.86 (sd=0.76) and 3.91 (sd=0.56) respectively. People from the age group 56 and above had the least pleasurable experience regarding efficiency. Mean score for this age group is 2.95 (sd=1.07).

For the education category, the mean scores for all of the groups are ranged between 3.04 and 3.97 with 'below SLC/SEE' group being the lowest and master's degree or above being the highest. Mean scores for SLC/SEE, +2/proficiency and Bachelor's degree are: 3.79, 3.85, and 3.96 respectively. Mean score only for the two groups; bachelor's and master's degree are above the overall mean score for efficiency.

For the gender category, female group is seen to have more positive opinions having mean score 4.10 (sd=0.61) which is the highest and above the overall mean for efficiency. On the other hand, male group has mean score of 3.89 (sd=0.76).

Regarding platform of use, mean score is almost similar with two groups where mean score for apple is 3.84 (sd=0.74) and android is 3.94 (sd=0.75)

Table 10: Demographic Category Comparisons for Efficiency

Variable	Level	N	Mean	SD	Min	Max
Age	16-25	83	3.988	0.704	1.666667	5
	26-35	216	3.867	0.767	1	5
	36-45	91	4.152	0.624	1	5
	46-55	32	3.911	0.566	2.166667	4.666667
	56+	10	2.950	1.072	1.666667	4.5
Education						
Education	Below SEE/SLC	8	3.042	1.194	1.666667	4.5
	SLC/SEE	20	3.792	0.823	1.833333	5
	+2/proficiency	47	3.851	0.799	1	4.833333
	Bachelors degree	152	3.961	0.681	1.833333	5
	Masters or above	205	3.978	0.727	1	5
Gender						
Gender	Male	351	3.893	0.765	1	5
	Female	81	4.103	0.612	2.166667	5
Platform of Use						
Platform of Use	Apple	71	3.847	0.756	1.833333	5
	Android	361	3.949	0.740	1	5
Efficiency						
Efficiency	Overall	432	3.932	0.743	1	5

4.1.5 Demographic comparison of system availability

System availability has overall mean score=3.11, (sd=1.03). The distribution of responses is presented in the table below, being based on the demographic component:

Respondents between the ages of 16 and 25 are reported to have most favorable thoughts about system availability. This age group has a mean score of 3.25 (sd=0.98), followed by the age group 26-35 with a mean score of 3.19 (sd=1.05) and the age group 36-45 with a mean score of 3.00 (sd=1.03). As noted in the efficiency section above, respondents aged '56 and above' had the least enjoyable experience with system availability, with a mean score of 1.90 (sd=0.65) followed by the respondents from age group 46-55, with a mean score of 2.84 (sd=0.77).

In the education category, respondents with education level below SLC/SEE group had least pleasant experience with system availability as a service from 'Nagarik App'. The mean score for the least educated people is 1.81 (sd=0.70) followed by the +2/proficiency group with mean score of 2.98 (sd=0.95). Respondents from the Master's degree or above, Bachelors degree and SLC/SEE category shared similar types of experience with mean scores of 3.18 (highest) (sd=1.03), 3.13 (sd=1.01) and 3.00 (sd=1.13) respectively.

Female respondents have less positive experiences with system availability than male respondents. The female gender has a mean score of 2.91 (sd=0.98), which is lower than the male gender's mean score of 3.16 (sd=1.03).

In terms of platform of use, the mean score for Apple is 3.09 (sd=0.91) while the mean score for Android is 3.11 (sd=1.05).

Table 11: Demographic Category Comparisons for System Availability

Variable	Level	N	Mean	SD	Min	Max
Age	16-25	83	3.259	0.980	1	5
	26-35	216	3.199	1.054	1	5
	36-45	91	3.005	1.034	1	5
	46-55	32	2.844	0.777	1	4.5
	56+	10	1.900	0.658	1	3
Education						
Education	Below SEE/SLC	8	1.813	0.704	1	3
	SLC/SEE	20	3.000	1.136	1	5
	+2/proficiency	47	2.989	0.953	1	5
	Bachelors degree	152	3.135	1.013	1	5
	Masters or above	205	3.188	1.033	1	5
Gender						
Gender	Male	351	3.160	1.038	1	5
	Female	81	2.914	0.980	1	5
Platform of Use						
Platform of Use	Apple	71	3.092	0.915	1	5
	Android	361	3.118	1.053	1	5
System Availability						
System Availability	Overall	432	3.113	1.031	1	5

4.1.6 Demographic comparison of privacy

Overall mean score for privacy is 3.13, (sd=0.93). The distribution of responses presented in the table below is based on the demographic components:

For the age category, three groups of respondents (ages 16-25, 26-35, and 36-45), mean score is greater than 3, while two groups (46-55 and 56+) have mean scores less than three. The study's youngest age group, 16-25, has the highest mean score of 3.21 (sd=0.90), followed by age groups 26-35 and 36-45, with mean scores of 3.21 (sd=0.94) and 3.01 (sd=0.90, respectively. The oldest respondents, as with previous measures, have the least enjoyable experience with privacy, with a mean score of 2.72 (sd=0.71), followed by the second oldest group of respondents, age 46-55, with a mean score of 2.81 (sd=0.92).

In the education category, respondents with education level below SLC/SEE group show the least pleasant experience with privacy of 'Nagarik App'. Mean score for the least educated users is 2.68 (sd=0.72) which is followed by +2/proficiency group with the mean score of 2.95 (sd=0.79). Respondents from the degree or above, bachelors degree and SLC/SEE category have mean score higher than 3 and the mean score for each group is 3.20 (sd=0.90), 3.11 (sd=0.98) and 3.08 (sd=1.10) respectively.

Female respondents have little lesser favorable experience with privacy than male respondents, and the mean value for both groups is above 3; the neutral point. The female gender has a mean score of 3.09 (sd=0.94), which is somewhat lower than the male gender's mean score of 3.14 (sd=0.93).

Platform of use category did not see any significant difference as the mean score for apple is 3.15 (sd=1.02) and for android group mean score is 3.12 (sd=0.91).

Table 12: Demographic Category Comparisons for Privacy

Variable	Level	N	Mean	SD	Min	Max
Age	16-25	83	3.217	0.906	1	5
	26-35	216	3.213	0.949	1	5
	36-45	91	3.011	0.909	1	5
	46-55	32	2.813	0.925	1.5	5
	56+	10	2.725	0.712	1.75	3.75
Education						
Education	Below SEE/SLC	8	2.688	0.729	1.75	3.75
	SLC/SEE	20	3.088	1.104	1.5	5
	+2/proficiency	47	2.952	0.790	1.75	4.75
	Bachelors degree	152	3.110	0.986	1	5
	Masters or above	205	3.207	0.907	1	5
Gender						
Gender	Male	351	3.140	0.930	1	5
	Female	81	3.090	0.947	1.5	5
Platform of Use						
Platform of Use	Apple	71	3.151	1.025	1.5	5
	Android	361	3.126	0.914	1	5
Privacy						
Privacy	Overall	432	3.130	0.932	1	5

4.1.7 Demographic comparison of fulfillment

Overall mean score for fulfillment is 3.67, (sd=0.83). Distribution of responses is presented in the table below, based on the demographic components.

Among the 6 groups of the age category, the younger 5 groups of age category shared similar type of experience with a mean score above 3.6 in relation to fulfillment. Two age groups 36-45 and 16-25 have mean score more than the overall mean of fulfillment having mean score 3.88 (sd=0.70) and 3.76 (sd=0.84) respectively. Age groups 26-35 and 46-55 have mean score 3.60 (sd=0.87) and 3.61 (sd=0.67) respectively which is slightly lesser than overall mean for fulfillment. However, the age group 56 and over having the least respondents has the lowest mean score of 2.62 (0.81).

In the education category, respondents with education level below SLC/SEE group have the least pleasant experience with fulfillment of 'Nagarik App'. The mean score for the least educated respondents is 2.71 (sd=0.88). The rest of the respondents in other groups have mean score above 3 and three education groups; +2/proficiency level mean score= 3.71 (sd=0.79), 'master's degree or above' mean score= 3.70 (sd=0.79), and bachelor's degree, mean score= 3.69 (sd=0.84) have mean score higher than the overall mean score of fulfillment. Respondents with education level of SLC/SEE had also a good experience regarding fulfillment having 3.51 (sd=1.07) as the mean score which is slightly lower than the average mean score of fulfillment.

For the gender category, female respondents are seen to have slightly a lesser pleasant experience with fulfillment compared to male respondents. Female gender has mean score 3.63 (sd=0.88) is almost similar score with the overall mean score for fulfillment. Mean score for male category is 3.85 (sd=0.93) which is above the overall mean for this variable.

Regarding platform of use, the mean scores for both of the groups are greater than 3.

Respondents who are using 'Nagarik App' on apple phones, has mean score 3.63 (sd=0.78) which is slightly lower than the overall mean score for fulfillment. On the other hand android group's mean score is 3.68 (sd=0.84).

Table 13: Demographic Category Comparison for Fulfillment

Variable	Level	N	Mean	SD	Min	Max
Age	16-25	83	3.768	0.844	1.25	5
	26-35	216	3.605	0.870	1	5
	36-45	91	3.887	0.703	1	5
	46-55	32	3.617	0.675	2.25	5
	56+	10	2.625	0.810	1.75	4
Education						
Education	Below SEE/SLC	8	2.719	0.881	1.75	4
	SLC/SEE	20	3.513	1.071	1.5	5
	+2/proficiency	47	3.713	0.792	1.5	5
	Bachelors degree	152	3.692	0.849	1.25	5
	Masters or above	205	3.705	0.797	1	5
Gender						
Gender	Male	351	3.632	0.885	1	5
	Female	81	3.858	0.562	2.25	5
Platform of Use						
Platform of Use	Apple	71	3.630	0.786	1.25	5
	Android	361	3.683	0.849	1	5
Fulfillment						
Fulfillment	Overall	432	3.674	0.838	1	5

4.1.8 Demographic comparison of responsiveness

Overall mean score for responsiveness is 3.35, (sd=0.92). Distribution of responses is presented in the table below, based on the demographic components.

Among the 6 groups of the age category, younger 5 groups of age category are seen to have a similar type of experience with mean scores above 3.2 in relation to responsiveness. Two age groups; 36-45 mean score 3.64 (sd=0.70) and 46-55 mean score 3.49 (sd=0.72), have the mean score above the overall mean followed by age group 26-35 with mean score of 3.29 (sd=0.99) and 16-25 mean score of 3.26 (sd=0.96). The oldest age group; 56 and above, having the least respondents, is seen to have the least pleasurable experience with responsiveness with the mean score of 2.50 (0.67).

In the education category, respondents with education level below SLC/SEE group have the least pleasant experience with responsiveness of 'Nagarik App'. Mean score for the least educated respondents with the least number of respondents is 2.56 (sd=0.74) indicating that they had the least pleasurable experience of responsiveness. 3 groups of the category +2/proficiency level, masters or above and SLC/SEE had the mean score that is above the overall mean of responsiveness. +2/proficiency level respondents have the highest mean score 3.44 (sd=0.78) followed by masters or above group with mean score 3.41 (sd=0.89) and SEE/SLC with mean score 3.36 (sd=1.12). Respondents with Bachelor's degree have the mean score of 3.29 (sd=0.97).

Regarding gender category, male respondents have slightly less pleasant experience with responsiveness. Mean score for this group is 3.67 (sd=67) which is higher than the overall mean score for responsiveness. Male gender has the mean score of 3.28 (sd=0.96) less than the overall mean score for responsiveness.

For the platform of use, the mean score for both of the groups is over 3. Apple group has mean score of 3.31 (sd=0.98) which is slightly lesser than the android group's mean score 3.36 (sd=0.91).

Table 14: Demographic Category Comparisons for Responsiveness

Variable	Level	N	Mean	SD	Min	Max
Age	16-25	83	3.265	0.969	1	5
	26-35	216	3.296	0.990	1	5
	36-45	91	3.640	0.708	1	5
	46-55	32	3.492	0.720	2	5
	56+	10	2.500	0.677	1.75	3.75
Education						
Education	Below SEE/SLC	8	2.563	0.741	1.75	3.75
	SLC/SEE	20	3.363	1.125	1.5	5
	+2/proficiency	47	3.447	0.785	1.25	5
	Bachelors degree	152	3.294	0.975	1	5
	Masters or above	205	3.417	0.894	1	5
Gender						
Gender	Male	351	3.286	0.961	1	5
	Female	81	3.676	0.675	1.25	5
Platform of Use						
Platform of Use	Apple	71	3.317	0.986	1	5
	Android	361	3.367	0.915	1	5
Responsiveness						
Responsiveness	overall	432	3.359	0.926	1	5

4.1.9 Demographic comparison of Contact

The responses received for contact (overall mean score=2.76, sd=0.98), could be categorized in the table below, being based on the demographic component. This independent variable has the least mean score among the independent variables indicating that users' experience was not pleasurable in connection with contact.

Three age groups have mean scores that are higher than the general mean score for contact. The youngest group of respondents seemed to have the highest value for mean of 2.96 (sd=0.98), followed by the age group 36-45 years, with a mean score of 2.77 (sd=0.90), and the age group 26-35 years, with a mean score of 2.76 (sd=1.03). Respondents in the age group 46-55 have mean score of 2.50(sd=0.77).The oldest respondents' age group 56+, on the other hand, has the lowest mean score of 1.82 (sd=0.48), suggesting that this group has the least joyful experience.

For the education category, mean score for all of the groups is ranged between 1.96 and 2.98. 'below SLC/SEE group' has the lowest mean score 1.96 (sd=0.43) meaning that this group had worst experience regarding contact services in education category. SEE/SLC group has mean score 2.98 (sd=1.38) as the highest mean score in this category which is above the overall mean score for contact. Rest of the two groups that have mean score above the overall mean are +2/proficiency level, and master's or above, having mean scores 2.81 (sd=0.90) and 2.83 (sd=0.94) respectively. Bachelor's degree group has mean score of 2.66 (sd=1.00) slightly below the overall average of contact.

For the gender category, female are seen to have more positive opinions having mean score of 2.84 (sd=0.91) and this score is above the overall mean for contact. On the other hand, male group has mean score 2.74 (sd=1.0).

Regarding platform of use, mean score is almost similar where the mean score for apple is 2.83 (sd=1.02) and android is 2.74 (sd=0.97).

Table 15: Demographic Category Comparisons for Contact

Variable	Level	N	Mean	SD	Min	Max
Age	16-25	83	2.961	0.984	1	5
	26-35	216	2.765	1.034	1	5
	36-45	91	2.777	0.903	1	5
	46-55	32	2.500	0.773	1.5	5
	56+	10	1.825	0.487	1.25	2.75
Education						
Education	Below SEE/SLC	8	1.969	0.432	1.5	2.75
	SLC/SEE	20	2.988	1.382	1.25	5
	+2/proficiency	47	2.819	0.902	1	5
	Bachelors degree	152	2.664	1.004	1	5
	Masters or above	205	2.834	0.944	1	5
Gender						
Gender	Male	351	2.745	1.000	1	5
	Female	81	2.846	0.914	1	5
Platform of Use						
Platform of Use	Apple	71	2.838	1.020	1	5
	Android	361	2.749	0.978	1	5
Contact						
Contact	Overall	432	2.764	0.984	1	5

4.1.10 Descriptive statistics for dependent variable; satisfaction

The following table displays the descriptive statistics for dependent variable user satisfaction. This variable was used as a single dimensional variable. Responses ranged from 1 to 5. Mean score of this dependent variable is 3.54(sd=0.85). According to 5-point Likert-scale, point 3 was used as neutral and point 4 as 'agree'. Being based on this explanation, it could be concluded that users agree that overall satisfaction level of 'Nagarik App' users is tilted towards 'satisfaction' slightly moving up from the neutral point.

Table 16: Descriptive Statistics for User Satisfaction

Variable/construct	N	mean	SD	min	max
satisfaction	432	3.549	0.852	1	5

4.1.11 Demographic comparison of the dependent variable; Satisfaction

Overall mean for the dependent variable; user satisfaction is 3.54(sd=0.85). Description of user satisfaction according to demographic categories is presented as below:

First, among the five age groups, the youngest group, aged 16-25 years, is seen to be more satisfied, with a mean score of 3.82(sd=0.77), which is higher than the overall mean of satisfaction. Age groups 26-35 years and 36-45 years received mean scores 3.54 (sd=0.91) and 3.58 (sd=0.69), respectively that are greater than the overall mean. The oldest section of the age category 56+ years, on the other hand, is the least pleased

group among the categories, with the lowest mean score 2.32(sd=0.57), significantly behind the general mean for satisfaction. This oldest group of respondents was followed by the second oldest group of respondents aged 46-55 years, with a mean score of 3.18 (sd=0.61), which is below the overall mean.

Second, in the education category, based on the mean score, education level and satisfaction level are seen interlinked. Except in the SEE/SLC group, satisfaction increased as education level grew. Master's or higher education group has the highest mean score of 3.62 (sd=0.83) followed by bachelor's degree group with a mean score of 3.57 (sd=0.82) and 2/proficiency level with a mean score of 3.42 (sd=0.75). The mean scores for three educational categories are lower than the overall mean. The lowest education level, 'below SEE/SLC,' has a mean score of 2.37 (sd=0.61), which is a little higher than the group 'SEE/SLC,' which had a mean score of 3.28 (sd=1.09).

Third, the gender category shows that both of the categories have similar type of experience. Mean score for the female gender is 3.55 (sd=0.76) but the number of the female responders is really low i.e. 81. Male group's mean score is 3.54 (sd=0.87) exactly the same as the overall mean score for satisfaction.

Lastly, the platform of use also does not show any striking difference between the mean scores of apple and android users. For the apple users, mean score was 3.55 (sd=0.87) and for android users this score is 3.54 (sd=0.85).

Table 17: Demographic Category Comparisons for User Satisfaction

Variable	Level	N	Mean	SD	Min	Max
Age	16-25	83	3.822	0.776	1.5	5
	26-35	216	3.542	0.916	1	5
	36-45	91	3.580	0.691	1	5
	46-55	32	3.180	0.616	2	5
	56+	10	2.325	0.578	1.25	3.25
Education						
Education	Below SEE/SLC	8	2.375	0.612	1.25	3.25
	SLC/SEE	20	3.288	1.095	2	5
	+2/proficiency	47	3.420	0.759	1.75	5
	Bachelors degree	152	3.576	0.827	1	5
	Masters or above	205	3.629	0.839	1	5
Gender						
Gender	Male	351	3.548	0.873	1	5
	Female	81	3.552	0.761	1.5	5
Platform of Use						
Platform of Use	Apple	71	3.553	0.867	1.25	5
	Android	361	3.548	0.851	1	5
User Satisfaction						
User Satisfaction	Overall	432	3.549	0.852	1	5

4.1.12 Reliability and Construct validity of the survey

Instruments

Principle Component Analysis was employed to evaluate the construct validity of the survey instruments used. The results obtained from the analysis suggest that most of the items/questions well represented the construct.

Items; co1, co2, co3, co4 were retained under factor 1; named contact. Pr1, pr2,pr3 ,and pr4 were retained under factor 2; named privacy. Re1, re2, re3, and re 4 were retained under factor 3 i.e. responsiveness. Factor 4; efficiency, consisted of ef1, ef2, ef3 and ef4. Fu1, fu2, fu3 and fu4 were under factor 5; fulfillment. Items; Sa1, sa2, sa3 and sa4 were retained under factor 6; system availability.

Regarding the items of system availability, the respondents recognized items; sa1 and sa2 as the items from efficiency so they are, finally, retained and grouped under efficiency.

Cronbach's alpha was used to examine the internal consistency of each factor. This value for contact, privacy and responsiveness are 0.902, 0.897 and 0.858 respectively. Cronbach's alpha for efficiency and fulfillment are 0.838 and 0.849 respectively. For system availability, this value is 0.840. And, for the dependent variable Chronbach's alpha is 0.888.

From the results of internal consistency, it could be concluded that retained factors for the study are reliable.

The following table displays the rearrangement of factors according to their factor loading:

Table 18: Factor Loading Results (Independent Variable)

	factor1	factor2	factor3	factor4	factor5	factor6
variance explained	2.972	2.942	2.814	2.737	2.168	1.538
factor name	contact	privacy	responsiveness	efficiency	fulfillment	system availability
item retained	co1, co2, co3, co4	pr1, pr2, pr3, pr4	re1, re2, re3, re4	ef1, ef2, ef3, ef4	fu1, fu2, fu3, fu4	sa1, sa2, sa3, sa4
Finally retained items	co1, co2, co3, co4	pr1, pr2, pr3, pr4	re1, re2, re3, re4	ef1, ef2, ef3, ef4, sa1, sa2	fu1, fu2, fu3, fu4	sa3, sa4
Cronbach's alpha	0.902	0.897	0.858	0.838	0.849	0.840
Dependent variable						
Cronbach's alpha						
variables	alpha					
User satisfaction	0.887					
standardized	0.888					

4.1.13 Correlations between variables of the study

Pearson correlation coefficient test was performed to compute the correlation between the variables. And the strength of the correlation coefficient was analyzed. Independent and dependent variables were measured as the average of the factor scores that is

collected by employing multiple Five-point-Likert-scale questions using a continuous measurement scale.

The control variables (Gender, age, education level, platform of use) were measured using an interval or nominal measurement scale. Age could be ranged to 5 groups starting from 16 to 56+, so it was measured by using interval measurement scale. Categorical variables; platform of use, education level and gender were computed by using a nominal scale. For the gender and platform variables, dummy variables were created and male category (0) and apple category (0) were taken as reference categories respectively.

4.1.14 Pearson's correlation coefficients test

In order to examine to what extent, the independent variables are correlated with each other, a correlation coefficient test was performed. According to (RubinAllen & ERBabbie, 2009), Pearson's correlation coefficient is a machinery to be used to predict the relationship and strength of correlation between the pairs of variables.

The results presented in the table below suggested that all the independent variables are positively correlated with statistical significance. The correlation coefficient and statistical significance between efficiency and system availability is ($r=0.649$, $p<0.0001$), efficiency and privacy ($r=0.328$, $p<0.0001$), efficiency and fulfillment ($r=0.328$, $p<0.0001$), efficiency and responsiveness ($r=0.602$, $p<0.0001$), efficiency and contact ($r=0.397$, $p<0.0001$).

Similarly, the correlation coefficient and statistical significance between System availability and efficiency is ($r=0.241$, $p<0.0001$), System availability and privacy ($r=0.508$, $p<0.0001$), system availability and fulfillment ($r=0.231$, $p<0.0001$), system

availability and responsiveness ($r=0.221$, $p<0.0001$), system availability and contact ($r=0.359$, $p<0.0001$).

Furthermore, the correlation coefficient and statistical significance between privacy and efficiency is ($r=0.328$, $p<0.0001$), privacy and system availability ($r=0.508$, $p<0.0001$), privacy and fulfillment ($r=0.350$, $p<0.0001$), privacy and responsiveness ($r=0.363$, $p<0.0001$), privacy and contact ($r=0.599$, $p<0.0001$).

As per the results, correlation coefficient and statistical significance between fulfillment and efficiency is ($r=0.649$, $p<0.0001$), fulfillment and system availability ($r=0.231$, $p<0.0001$), fulfillment and privacy ($r=0.350$, $p<0.0001$), fulfillment and responsiveness ($r=0.714$, $p<0.0001$), fulfillment and contact ($r=0.648$, $p<0.0001$).

Correlation and coefficient and level of statistical significance between responsiveness and efficiency is ($r=0.602$, $p<0.0001$), responsiveness and system availability ($r=0.221$, $p<0.0001$), responsiveness and privacy ($r=0.363$, $p<0.0001$), responsiveness and fulfillment ($r=0.714$, $p<0.0001$), responsiveness and contact ($r=0.585$, $p<0.0001$).

Finally, correlation and coefficient and level of statistical significance between contact and efficiency is ($r=0.397$, $p<0.0001$), contact and system availability ($r=0.359$, $p<0.0001$), contact and privacy ($r=0.599$, $p<0.0001$), contact and fulfillment ($r=0.495$, $p<0.0001$), contact and responsiveness ($r=0.585$, $p<0.0001$).

Pearson's correlation coefficient test showed that there is weak positive to strong positive correlation coefficient between the variables and correlation coefficient is statistically significant.

Table 19: Result of Pearson's Correlation Coefficient Test

Pearson correlation coefficient, N = 432						
under H0: Rho=0, Prob > r						
	Efficiency	System Availability	Privacy	Fulfillment	Responsiveness	Contact
Efficiency	1.000	0.241	0.328	0.649	0.602	0.397
		<.0001	<.0001	<.0001	<.0001	<.0001
System availability	0.241	1.000	0.508	0.231	0.221	0.359
	<.0001		<.0001	<.0001	<.0001	<.0001
Privacy	0.328	0.508	1.000	0.350	0.363	0.599
	<.0001	<.0001		<.0001	<.0001	<.0001
Privacy	0.649	0.231	0.350	1.000	0.714	0.495
	<.0001	<.0001	<.0001		<.0001	<.0001
Fulfillment	0.602	0.221	0.363	0.714	1.000	0.585
	<.0001	<.0001	<.0001	<.0001		<.0001
Contact	0.397	0.359	0.599	0.495	0.585	1.000
	<.0001	<.0001	<.0001	<.0001	<.0001	

4.2 Hypotheses testing

This subsection deals with the results of multiple linear regressions. Multiple linear regressions between the dependent variable (user satisfaction) and independent variables (efficiency, system availability, privacy, fulfillment, responsiveness, and contact) were performed with control variables (age, education level, gender, and platform of use) to test the hypotheses of this study.

4.3 Multiple Linear Regression Analysis

All 432 observations were processed into multiple regression model. Table below displays the estimated parameters of each independent variable, standardized coefficient, F-value, R-square and adjusted R-square for the regression model.

Users' satisfaction is explained by the regression model. Adjusted R square (0.628) indicated that this model explains the variation of the dependent variable by 62.8 percent. Overall, the regression model is statistically significant. Standardized coefficient suggested the strength of effect of each independent variables on dependent variable.

This result suggested that at least one of the independent variables (efficiency, system availability, privacy, fulfillment, responsiveness, and contact) or control variables (age, education level, gender and platform of use) in this model has a statistically significant relationship with the dependent variable (user satisfaction).

In this light, each of the hypotheses of this study will be tested based on the regression coefficient of every independent variable in relation to the dependent variable.

Table 20: Regression Coefficient of Independent Variables in Regression Model

Dependent variable: satisfaction					
Model 2					
Variable	Understand Coefficients	S.E	t Value		Standardized Coefficients
Intercept	0.306	0.216	1.41		0.000
Efficiency	0.241	0.047	5.18	***	0.210
System Availability	0.045	0.029	1.55		0.054
Privacy	0.141	0.037	3.86	***	0.155
Fulfillment	0.328	0.047	6.98	***	0.323
Responsiveness	-0.038	0.044	-0.86		-0.042
Contact	0.255	0.037	6.83	***	0.295
Age	-0.099	0.030	-3.28	***	-0.107
Education	0.042	0.029	1.46		0.047
Gender	-0.117	0.066	-1.77	*	-0.054
Platform	-0.005	0.068	-0.07		-0.002
Number of observations	432				
F-value	73.32				
Pr>F	<.0001				
R-square	0.637				
Adjusted R-square	0.628				

* :- p < 0.1

** :- p < 0.05

*** :- p < 0.01

4.3.1 Hypothesis 1

The regression coefficient of independent variable efficiency ($\beta_1 = 0.241$), which is statistically significant at the level ($p < 0.01$) and effect of efficiency on user satisfaction was measured by standardized coefficient; the value 0.210 indicates that the effect is comparatively strong. Therefore, this is the strong predictor of the user satisfaction in this study. With this statistical analysis, it can be concluded that there is sufficient evidence to reject the first null hypothesis of this study. Thus, it has been confirmed that there is a positive and statistically significant relationship between efficiency and user satisfaction.

4.3.2 Hypothesis 2

The regression coefficient of independent variable system availability ($\beta_2 = 0.045$), level of statistical significance is ($p > 0.1$), and the standardized coefficient is (0.054). Therefore, system availability is positively related with user satisfaction but this relation is statistically insignificant and strength of effect is the second weakest compared to other independent variables. Thus, System availability is not statistically significant predictor of the dependent variable; user satisfaction in this study. With this statistical analysis, it can be concluded that there is insufficient evidence to reject the second null hypothesis of this study. Thus, there is a positive relationship between system availability and user satisfaction which is statistically insignificant.

4.3.3 Hypothesis 3

The regression coefficient of independent variable privacy ($\beta_3 = 0.141$), which is statistically significant ($p < 0.01$) and level of effect with standardized coefficient 0.155. Therefore, privacy is statistically significant predictor of user satisfaction in this in this

model. And the comparative effect on user satisfaction is strong. So, there is sufficient evidence to reject the third null hypothesis of this study. It could be concluded as there is a positive and statistically significant relationship between privacy and user satisfaction

4.3.4 Hypothesis 4

The regression coefficient of independent variable fulfillment ($\beta_4 = 0.328$), which is statistically significant ($p < 0.01$). Standardized coefficient, in this model, 0.323 suggested this independent variable has strongest effects on user satisfaction. Therefore, fulfillment is statistically significant and the strongest predictor of the dependent variable in this model. With this statistical analysis, it can be concluded that there is sufficient evidence to reject the fourth null hypothesis of this study confirming that there is positive and statistically significant relationship between fulfillment and user satisfaction.

4.3.5 Hypothesis 5

From the regression table, the regression coefficient of independent variable responsiveness ($\beta_5 = -0.038$) meaning that responsiveness and user satisfaction are negatively related with each other. And this relationship is statistically insignificant ($p > 0.1$). Responsiveness has the lowest and negative score for standardized coefficient (-0.042), indicating the weakest and negative effects on user satisfaction. So, there is insufficient evidence to reject the fifth null hypothesis of this study. Thus, the proposed hypothesis is rejected as there is negative relationship between responsiveness and user satisfaction which is statistically insignificant.

4.3.6 Hypothesis 6

The regression coefficient of independent variable contact ($\beta_6 = 0.255$) is statistically significant ($p < 0.01$), and the effect on user satisfaction is second strongest among the independent variables with standardized coefficient value of 0.295. Therefore, contact is statistically significant and strong predictor of the dependent variable; user satisfaction in this model. So, there is sufficient evidence to reject the sixth null hypothesis of this study confirming that there is positive and statistically significant relationship between contact and user satisfaction.

The following table summarizes the results of hypothesis testing

Table 21: Hypotheses Testing Results

Hypothesis	Results
Efficiency of the 'Nagarik App' positively influences user satisfaction in Nepal.	Confirmed***
System availability of the 'Nagarik App' positively influences user satisfaction in Nepal.	Not Confirmed
Privacy of the 'Nagarik App' positively influences user satisfaction in Nepal.	Confirmed***
Fulfillment of the 'Nagarik App' positively influences user satisfaction in Nepal.	Confirmed***
Responsiveness of the 'Nagarik App' positively influences user satisfaction in Nepal.	Not Confirmed
Contact of the 'Nagarik App' positively influences user satisfaction in Nepal.	Confirmed***

The following figure summarizes the relationship between the independent and dependent variable obtained from multiple regression model:

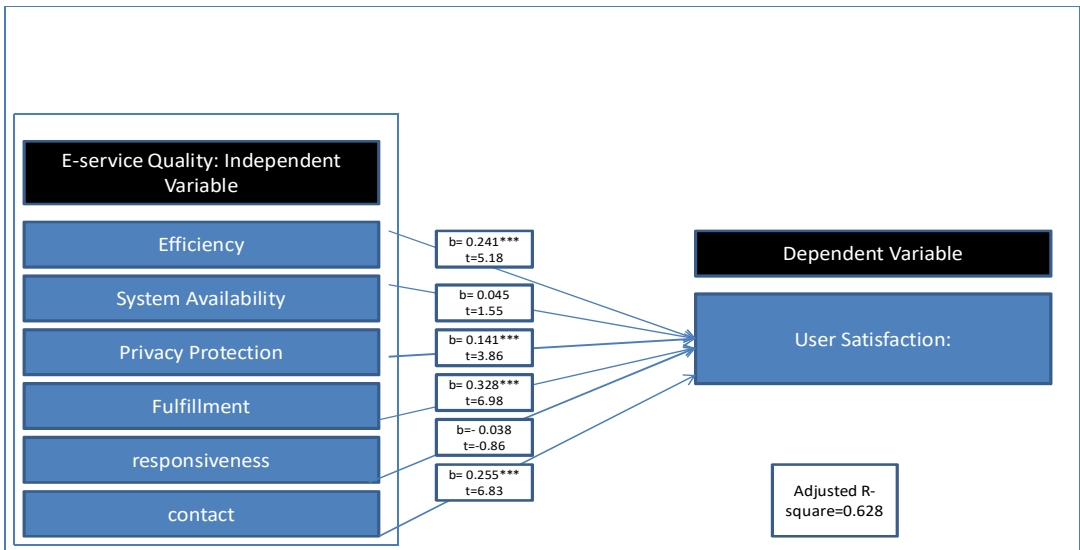


Figure 9: Relationship between independent and dependent variable obtained from regression model

The following figure illustrates the relative strengths of the independent variables on user satisfaction. Fulfillment is seen to have the strongest effect on user satisfaction followed by contact and efficiency. On the other hand, responsiveness has the weakest effect on user satisfaction followed by system availability and privacy.

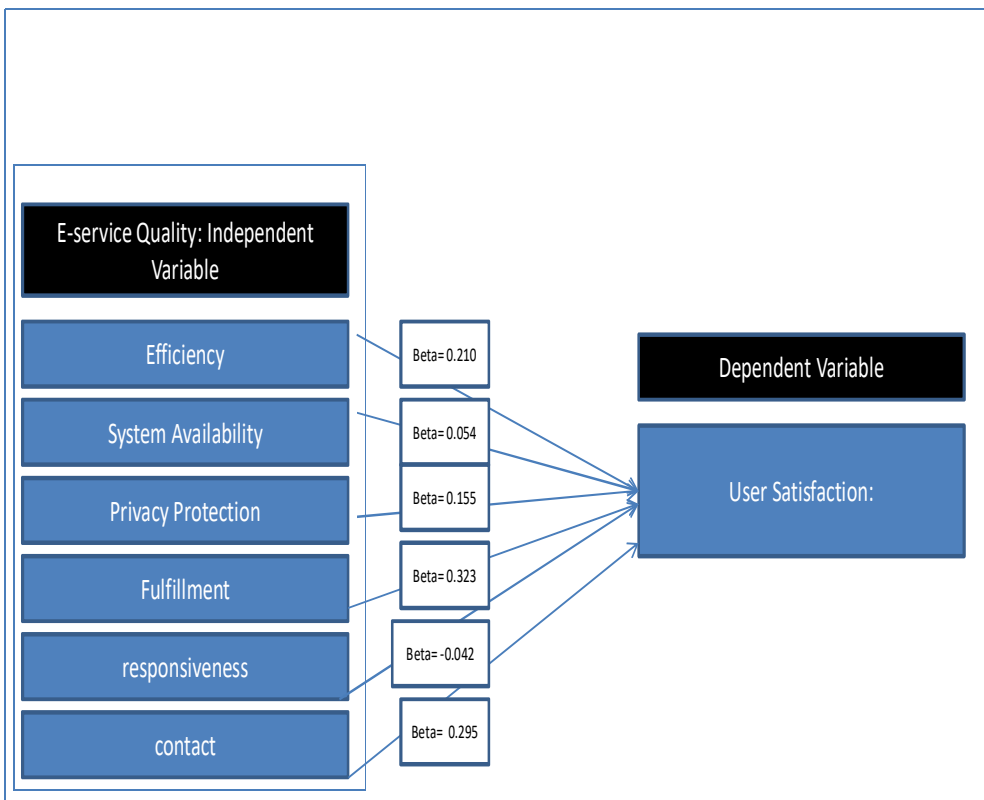


Figure 10: Relative strengths of the independent variables

The following table rearranged the independent variables being based on their comparative strengths on user satisfaction calculated from standardized coefficient:

Table 22: Ranking of Independent Variables Based on Standardized Coefficient

Variable	Standardized coefficient	Rank based on standardized coefficient
Fulfillment	0.323	First
Contact	0.295	Second
Efficiency	0.210	Third
Privacy	0.155	Fourth
System availability	0.054	Fifth
responsiveness	-0.042	sixth

4.4 Summary of the Major findings

The major objectives of this study were to find out to what extent the users of 'Nagarik App' are satisfied and which construct of e-service quality has greater influence in user satisfaction. Four out of six hypotheses were confirmed and fulfillment is seen to have the strongest effect on user satisfaction. After analyzing the opinions collected from 'Nagarik App' users from Nepal, there are 3 major findings of this study.

First, mean score for independent variables; efficiency (3.93), system availability (3.113), privacy (3.130), fulfillment (3.674), responsiveness (3.359) and contact (2.764) suggested that respondents gave more positive responses to efficiency, followed by fulfillment. At the same time, contact has the least mean score indicating that users had least pleasurable experience with the services related with contact followed by privacy.

Among the independent variables, fulfillment is estimated to have the strongest effect on user satisfaction compared to other variables in analysis followed by contact variable. Responsive, on the other hand, is suggested by the model to have the negative and weakest effect on user satisfaction, which is followed by system availability. Efficiency and privacy are in the middle showing comparatively medium effects on user satisfaction. The government needs to be more focused on the accomplishment of the request and tasks on time requested and sent by the users. This will increase the satisfaction level of users. Government of Nepal has to pay special attention to contact segment of the application as this variable has second highest effects on user satisfaction but the mean score for this app showed that users have the least pleasurable experience with this.

Only the 4 independent variables efficiency privacy, fulfillment, and contact have positive and statistically significant relationship with user satisfaction. Changes made in those variable-related service sectors would be reflected on user satisfaction. Rest of the two independent variables; system availability (positive) and responsiveness (negative) have statistically insignificant relationships with user satisfaction.

Second, the mean score for the dependent variable, user satisfaction is 3.549. This number just slight above the neutral opinion indicates that users' experience of using 'Nagarik App' is slightly tilted towards satisfaction. Still, there's huge space and requirements for improvement to increase the users' satisfaction.

Third, among the four control variables, only age and gender have statistically significant relation with satisfaction. Age is negatively related to the dependent variables with strong statistical relation ($p < 0.01$). It indicated that compared to the older people, the younger

generation is friendlier to the online mobile-based e-services and more satisfied. Gender is also negatively related with the dependent variable with statistical significance level ($p < 0.1$). Having negative relationship in explaining the variance of user satisfaction indicated that male users are more satisfied than female users (dummy variable for analysis: male was used as reference category (0)). Rest of the control variables; education and platform of use did not show any statistically significant relationship with user satisfaction.

4.4.1 Efficiency and user satisfaction

From the model applied to this study, efficiency as a predictor variable stood as the strong influencer to the dependent variable. In this study, efficiency is understood as the convenient and speed of accessing and using 'Nagarik App'. Coefficient for efficiency is 0.241 which means 1 point change in efficiency will affect user satisfaction by 0.241 point into the same direction. And this predictor has comparatively significant effects (standardized coefficient 0.210) on user satisfaction.

This application is easily available in android and apple platforms. It can be easily downloaded and could be used by any Nepali citizen with a simple verification process. With a simple verification, all the services, as promised by the government, are easily available inside the app. This easy access, organization of the services inside the application (though only a few in numbers), and convenience of use might have been reflected in the mean value of efficiency (3.932) which is the highest among the independent variables.

Easier access and convenient services in terms of number and quality that are simple

enough for users to find what they search for are needed to be added to increase the satisfaction level of the users.

This confirms the findings of (Bauer, Falk, & Hammerschmidt, 2006) that this efficiency element 'serves as the key factor in e-governance' in determining users' satisfaction. This finding is similar with the findings of (Yoo & Donthu, 2001) who concluded 'easiness in usage is the significant factor having greater influence in user satisfaction' and the conclusion of (Jun, Liangliang, & Fubin, 2009); e-government services (websites) be well-organized, navigable, and well-structured that help customers discover what they need without being lost or confused.

4.4.2 System availability and user satisfaction

System availability, in this study, is taken as the correct technical functioning without operational failure of the application. This independent variable has a positive (coefficient=0.045) but statistically insignificant relationship ($p > 0.1$) with the dependent variable, and has comparatively weaker effect (standardized coefficient=0.054) on user satisfaction. Thus, this variable, being based in the current model, cannot explain user satisfaction.

The mean score for this variable is 3.113 which indicate that average experience of the users regarding availability, launching process, crash and freezing condition of 'Nagarik App' is just above the neutral point. This conclusion is contrary to the conclusions of (Obi, 2009); who studied websites of e-government portals and found that accessibility, and availability of the services 24 hours a day and 7 days a week will enhance the user satisfaction. The finding in this regard is similar to the conclusion of (Jerry, 2020), who examined the accessibility of e-government services in the Congolese context and did not find any significant relationship with user satisfaction.

4.4.3 Privacy and user satisfaction

Privacy, for this study is regarded as the degree to which the application is safe and protects customers' information. This variable stood as the strong predictor of users' satisfaction. Privacy explains 14 percent variability in user satisfaction in this model with strong statistical significance. Overall Mean for privacy was 3.130 indicating that 'Nagarik App' users' neutral opinion slightly tilted to satisfaction, that safety and security features of this app are adequate and there are enough provisions for protecting personal information and transaction. And, this predictor has substantial effects (standardized coefficient 0.155) on user satisfaction.

The findings in this regard, are consistent with the conclusions from (Obi, 2009) who found that customers' confidence on the data protection declaration from the service provider had positive relation with satisfaction and partially similar with the findings of (Cristobal, Flavian, & Guinaliu, 2007) who concluded lack of confidence in protecting the data can cause obstructions in e-service development. Findings on information security and transaction security in Afghanistan's context by (Anwer, Esichaikul, & Anjum, 2016) are similar with the current conclusions; they found strong relationship between citizen satisfaction and security of information and transaction.

4.4.4 Fulfillment and user satisfaction

Fulfillment, in this study, is understood as the level to which the application's promises are translated into reality to accomplish the task requested by the users of 'Nagarik App'. According to the model used in this study, fulfillment as a predictor variable stood as the strong influence in dependent variable. This independent variable has the strongest effect

(standardized coefficient=0.323) on user satisfaction.

The overall mean value for this variable is 3.674 indicating that users' experience was slightly tilted towards satisfaction from the neutral point. This mean also explained that peoples' perception regarding the delivery of this app is good. It could be concluded that requests were met with truthful offerings and delivery of the services to satisfy the goal of 'Nagarik App'.

Conclusions derived confirmed the findings of (Kim, Jung-Hwan, & Sharron J., 2006); fulfillment is the most important factor of e-services that 'should' be emphasized for better service quality and the findings from (Yang & Fang, 2004) who concluded that e-service platforms not performing the promised task in the designated time, will increase dissatisfaction in the users leading to discredit of the e-government platforms. Findings from (Anwer, Esichaikul, & Anjum, 2016), are similar to the current conclusions, e-government services and process performance that people get from multiple channels are important for citizen satisfaction in Afghanistan.

4.4.5 Responsiveness and user satisfaction

Responsiveness is defined as the effective handling of problems and refunds through the provider. It is mainly related to the responses that the service provider extends to quarries/problems that the users face while seeking the service through this app. Criteria of measurement were immediate response to the requests, information on the progress, prompt response to the problems and refund if necessary.

The average mean for this variable (3.359) indicates that people's perception regarding responsiveness of the app is above the neutral point. However, according to the regression table, this variable is negatively (coefficient= -0.038) related with user satisfaction and this relationship is not statistically significant ($p > 0.1$). Standardized

coefficient (-0.042) showed, this variable has negative and the weakest effects on user satisfaction.

Conclusions in this regard are contradictory to the findings of (Dabas & bajaj, 2019), who found the significant and positive relationship between responsiveness and user satisfaction of online banking service in India. And findings are differed from (Lin & Lee, 2005), who claimed that responsiveness and users' satisfaction are strongly co-related in the context of online shopping.

4.4.6 Contact and user satisfaction

For the purposes of this study, contact is defined as the availability of support from the service provider via an online system. To reach the conclusion, the service provider's availability, ease of contact, and ability to contact the service provider via the app were all measured.

The regression model showed that coefficient for contact is 0.255 which confirms the positive relationship with user satisfaction with statistical significance ($p < 0.01$). This predictor variable has comparatively the stronger (standardized coefficient 0.295, second only to fulfillment) effect on user satisfaction.

conclusion from (Kim, Jung-Hwan, & Sharron J., 2006), in this regard is similar; contact and offering help to online users play vital roles to increase the users' satisfaction in e-service platforms. As an independent variable, contact explains the 25% of the variability of user satisfaction in this model. The overall mean for this variable is lowest (2.764) among the independent variables and below the neutral point. This indicates that service provider has to pay more attention to provide real time contact facilities to the service seekers.

4.4.7 Control variables and user satisfaction

Four control variables were used in this study; age, education level, gender, and platform of use. Out of the four control variables, according to regression table, only two; age and gender showed statistically significant relationship with variables studied. Age, as one of the control variables has negative (-0.099) and statistically significant ($p < 0.01$) relationship with the other variables. In Nepali context, the younger generation is more exposed to online and internet based services. It indicated that compared to the older people, younger generation is friendlier to the online mobile based e-services and more satisfied. As they are having higher number of exposures resulting in rich experiences of using mobile and mobile based applications, they might have found 'Nagarik App' easy to operate and get served online. On the other hand, the older generation in Nepal gets very little opportunities to interact and use online based services. This might have resulted in lower levels of satisfaction among the older respondents. This also suggests a serious policy issue to be addressed; the digital divide created by generation gap.

Gender, in the regression table, is also negatively related to the dependent variable with statistical significance level ($p < 0.1$). The presence of a negative association in explaining the variation in user satisfaction revealed that male users have more pleasurable experiences of using 'Nagarik App' than female users. The findings reveal information about the usage of e-government-related services, gender discrepancies, and age-related variances. The lower number of responses (81) from female gender indicates that women appear to be less exposed to ICTs due to their social, economic, and educational position. As a result, when launched without considering women's gender and their lower exposure to ICTs, e-government programs may deepen digital-gender inequality rather than promoting women's empowerment. To access e-government services, users must have specific knowledge, skills, and equipment. Women, who are

sidelined in traditional culture in developing countries like Nepal, are less exposed to it than males. As a result, women's lower participation in digital activities promotes a gender gap in e-literacy.

The findings also revealed that young people are more pleased with the e-services provided by the 'Nagarik App.' While the younger generation has been given more exposure to digital gadgets and the internet, the elder age has had limited opportunities to become acquainted with the technology. The result could be observed in customer satisfaction with e-services provided through the mobile-based 'Nagarik App.' The state must pay attention to simplifying the procedure while creating mobile-based e-services for its citizens. So that, the elderly people, who have lesser internet exposure, may also benefit from the hassle-free services.

Rest of the control variables; education and platform of use didn't show any statistically significant relationship with user satisfaction.

Finally, there were 6 independent variables, 4 control variables, and 1 dependent variable in this study. Four out of the six independent factors (efficiency, privacy, fulfillment, and contact) showed a positive and statistically significant association with user satisfaction, whereas only two control variables (age and gender) have a negative and statistically significant relationship. Based on this outcome, the final regression line could be described as follows:

$$\text{Satisfaction} = 0.306 + 0.241 * \text{efficiency} + 0.141 * \text{privacy} + 0.328 * \text{fulfillment} + 0.255 * \text{contact} + -0.099 * \text{age} + -0.117 * \text{gender}$$

Chapter 5: Conclusion, Recommendations and Limitations

This study was developed and conducted in order to assess the level of satisfaction of 'Nagarik App' users and to examine which element of e-service quality has significant effect on user satisfaction of 'Nagarik App' users in Nepal. Following a rigorous analysis of the prior literature, 6 hypotheses were developed. The data for the study was gathered through the use of a Google-based online survey. To test the hypotheses, a multiple linear regression model was adopted. This section of the study discusses the conclusion, policy recommendations, recommendations for further research, and limitations of the study

5.1 Conclusion

This study examined the relationship between e-service quality measures and user satisfaction as the independent and dependent variables, respectively, based on the research question: how satisfied are 'Nagarik App' users in Nepal and which variable of e-service quality has the greater influence in user satisfaction. Previous literature were reviewed and evaluated in order to identify the research gap in the Nepali context. Expectation confirmation theory was used to analyze the satisfaction in this study. The essence of this theory is that customers are expected to continue using a product or service if it this met their expectations. Previous research proposed six independent factors to examine their influence on user satisfaction, the dependent variable. They are efficiency, system availability, privacy, fulfillment, responsiveness, and contact.

Six hypotheses were established following a review of the literature. According to the hypotheses, all of the components of e-service quality have positive effects on customer satisfaction (but the results didn't confirm all the hypotheses). Population for the research included all Nepali people who are using the 'Nagarik App.' Desired sample size for this population was 385. An online Google-form-based survey was developed with a screening question, asking whether the responder is using 'Nagarik App' or not. As the complete list of the total population couldn't be found, researcher randomly selected 750 potential responders and sent them the questionnaire. 502 of them had responded. Only 432 responders stated that they were using 'Nagarik App' while the remaining 70 responded that they were not. Thus, the final sample size to be studied was 432.

Data collected from the online survey were analyzed by using SAS software. After processing data, Pearson's correlation indicated that all the independent variables were correlated positively with statistical significance.

Multiple linear regression was performed to examine the proposed hypothesis. Regression model revealed that four independent variables; efficiency, privacy, fulfillment and contact have positive and statistically significant relationship and can predict the changes in user satisfaction; the dependent variable. Thus, out of the six hypotheses, four were confirmed. The first null hypothesis was rejected confirming that efficiency and user satisfaction has positive and statistically significant relationship. Second hypothesis was related to the relationship of system availability and user satisfaction. Regression table indicated that system availability and user satisfaction were positively related but that relationship was not statistically significant. Thus, the second null hypothesis was accepted. Regarding the third hypothesis, regression model showed that independent variable privacy has positive and statistically significant relationship

with dependent variable user satisfaction. Thus, the third null hypothesis was rejected. Fourth null hypothesis was rejected as there is positive and statistically significant relationship with fulfillment and user satisfaction. However, there was no sufficient evidence to reject the null hypothesis for fifth hypothesis, as responsiveness is projected to have negative and statistically insignificant relationship with user satisfaction. Finally, the sixth null hypothesis was rejected as the independent variable contact has positive and statistically significant relationship with user satisfaction.

When the relative strength of the independent variables is compared, fulfillment comes out on top, followed by contact. This implies that service users will be more pleased if the requested work is accomplished within the time frame promised by the service provider. If a prompt, easy, and hassle-free contact mechanism is easily available to assist, the level of satisfaction will also rise. In contrast, responsiveness has negative and weakest impact on user satisfaction, followed by system availability.

The predictors in the regression model indicated that 62.8% percent variability in user satisfaction among the users of 'Nagarik App'. The major findings of the study are supposed to be referential for the policies to be formulated and executed in e-governmental sector in Nepal, especially in mobile-application based services.

5.2 Policy Recommendations to the Government of Nepal

As this study concluded that four out of six e-service quality measures have a strong and significant relationship with users' satisfaction, those measures need to be paid more attention while developing mobile based government services. Average satisfaction level of 'Nagarik App' users is just above the neutral point indicating that the users are not fully

satisfied with the services extended by the government through 'Nagarik App'. Government has to work for the betterment of e-service quality measures so that people will enjoy the smooth e-service and that will be resulted in higher level of user satisfaction.

Among the e-service quality measures, contact has scored the lowest average. The app administrator has to develop efficient communication mechanism that will enable people to contact and seek assistance from the developer or report their problems if any. For such a mechanism, government may establish rapid response team with communication experts assisted with a team of engineers and trouble-shooters.

Further, government has to address the possible challenges that might arise when people in their old age or the people having lesser exposure to the digital devices are trying to use the application.

This application needs to be expanded in terms of services to be rendered. As the government promised to provide public services at the fingertips of the people, more services are required to be available, verification of users is required to be smooth, privacy and confidentiality of data generated should to be maintained. For this to happen, 'Nagarik App' administrators may coordinate with the relevant agencies of the government, stakeholders from the private sectors and financial institutions. Currently, the majority of the government agencies are offering services through mobile application or web portals. To seek the services from the different government agencies, at the every stop, citizens have to verify their records. 'Nagarik App' administration may coordinate with those agencies and blend the services into the application so that there will be one stop verification and single door entry to the avenues of the different services.

Fulfillment stood at the top to show comparatively the strongest effect on user satisfaction. Prompt response to the requests made by the users and task accomplishment are seen as key factors in user satisfaction. This suggests that the government has to pay more attention to complete the requested task within the promised timeframe. Government may enhance the capacity of the application with added automatic response features along with the efficient and well trained human resources. Government has to invest more resources to form a special task force within the application management, so that this efficient team would be able to handle the requests promptly to deliver the results to the customers. This task force may create a detailed calendar with the time frame for every possible requests and tasks to be addressed.

Also the government has to address the issue of digital divide and promote e-literacy and awareness targeting female gender and older generations. Government may develop tutorials; pamphlets, brochures, and videos regarding the usage of government applications and make them easily available in the app and broadcast them through different media platforms.

Finally, while developing and improving mobile based governmental applications, the government has to pay special attention to e-service quality aspect of it. All the governmental services available in a single application-window with excellent and well managed e-service quality will help to translate the overarching goal; 'serving people at their finger tips' into reality.

5.3 Recommendations for future studies

This study was designed to examine the satisfaction level of 'Nagarik App' users and to

find out the most influential factor of e-service quality of this app that has greater effect on user satisfaction in Nepali context. This is non-experimental, descriptive study design that used quantitative data for analysis. There are three major factors affecting user satisfaction in DeLone and MacLean's IS success model; information quality, service quality and, system quality. Because of the limited time frame, this study used only service quality as the predicting factor and user satisfaction as the dependent variable. So, in order to have an overall level of satisfaction with the 'Nagarik App,' information quality and system quality are suggested to be investigated further. It is also advised that opinions from the developer's perspective be included in future research. In this study, the expectation confirmation theory was employed to assess satisfaction; future studies may utilize different theories to test the same and see if the present study's conclusions are confirmed or not.

An experimental study, in this regard, is highly recommended between the two groups; one group of citizens who are served offline at the government offices as control group and another experimental group of service seekers who are served by 'Nagarik App' with exactly the similar services.

5.4 Limitations of the Current study

To conclude the study, that there are a few limitations acknowledged by the researcher. First, population for this study was fairly large. The conclusions derived from the responses from 432 sample size, may not be enough to generalize in external settings. Thus, this study may not have enough external validity.

Second, time limit and geographical distance are also identified as limitations of this

study. Because of time constraints and geographical distance, the views from the developers' side could not be incorporated into this study. And experimental research design could not be applied because of the geographical distance between the researcher and the sample of the study.

Third, data were collected using online Google based survey form. According to (Schmidt, 1997), there are several benefits of using world-wide web based survey such as reaching the population, cost effectiveness and time saving, at the same time there are several challenges such as 'missing data, unacceptable responses, duplicate submissions and web abuse'. In order to minimize the risks mentioned, every single possible preventive measure was applied. Separated Google sheet was created to collect the responses, so that each and every response was recorded automatically in that particular sheet. 'Limit to one response' feature in the Google-based survey instrument was turned on so that every respondents have to log in to Google to take part in the survey and once the response has been submitted, Google form does not allow for 2nd response.

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Annexure 1: Survey instrument (questionnaire)

Section 1

Dear Respondents, greetings

This survey questionnaire is designed to collect the data regarding the level of satisfaction of the users of 'Nagarik App' for the dissertation entitled: "Analyzing user satisfaction in E-government practices in Nepal (*A study on the effects of E-service quality of 'Nagarik App' on user satisfaction*)" which is prepared as the partial fulfillment of the requirements for the Masters degree in Seoul National University, Republic of Korea.

Data collected will be used for statistical purpose only. And privacy and confidentiality will be maintained.

For your best understandings, the findings of this study will be the referential for the betterment of e-service aspect this 'Nagarik App' and provide important insights and will serve as corner stone for the future projects related with the development of e-service based governmental applications.

It will take 5 minutes for you to participate in this survey. I appreciate and request for your honest participation.

If you have any queries and suggestions, I heartily welcome you in my communication channels as follows:

Email:

Phone:

Question for filtering:	
Are you a Nepali citizen and using 'Nagarik App'? with picture of 'Nagarik App'	
<u>Yes</u> (will lead to rest of the survey questionnaire)	<u>No</u> : leads directly to submit section

Section 2

Questions regarding your level of satisfaction regarding the various dimensions of e-service quality aspect of 'Nagarik App'

Please rate the following aspects of Nagarik App, from 1 to 5, being based on your experience of using Nagarik App.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Questions related with Efficiency					
'Nagarik App' is simple to use.	1	2	3	4	5
'Nagarik App' is well organized.	1	2	3	4	5
Inside 'Nagarik App' I can easily find what I need	1	2	3	4	5
'Nagarik App' is convenient	1	2	3	4	5

<u>Section 3</u>					
Questions related with System availability					
'Nagarik App' is always available with services	1	2	3	4	5
'Nagarik App' launches and runs right away	1	2	3	4	5
'Nagarik App' does not freeze after I request for service	1	2	3	4	5
'Nagarik App' does not crash	1	2	3	4	5
<u>Section 4</u>					
Questions related with Privacy					
'Nagarik App' has adequate security features.	1	2	3	4	5
'Nagarik App' does not share my personal information with others	1	2	3	4	5
'Nagarik App' protects my personal information from unauthorized access.	1	2	3	4	5
'Nagarik App' protects information about my transactions (pin/security code)	1	2	3	4	5
<u>Section 5</u>					
Questions related with Fulfillment					
I get the service that I request for	1	2	3	4	5
'Nagarik App' is truthful about its offerings	1	2	3	4	5

'Nagarik App' provides services as promised	1	2	3	4	5
'Nagarik App' satisfies its purpose	1	2	3	4	5
<u>Section 6</u>					
Questions related with Responsiveness					
'Nagarik App' offers promptness of reaction to requests.	1	2	3	4	5
'Nagarik App' advises me the solutions for the transactions that are not processed	1	2	3	4	5
'Nagarik App' solves problems promptly	1	2	3	4	5
'Nagarik App' handles refund requests in a proper way	1	2	3	4	5
<u>Section 7</u>					
Questions related with Contact					
The governmental channel is designated and available to contact	1	2	3	4	5
Service representatives are available online	1	2	3	4	5
There is no difficulty to communicate with the agency	1	2	3	4	5
I can contact the agency using "Nagarik App"	1	2	3	4	5

Section 8

Questions related with satisfaction

I am satisfied from the e-services of 'Nagarik App'	1	2	3	4	5
E-services of 'Nagarik App' meet my expectation	1	2	3	4	5
I will continue to use 'Nagarik App'	1	2	3	4	5
I recommend people to use 'Nagarik App'	1	2	3	4	5

Section 9

Questions related with demographic information about the respondents

<u>Age:</u>	16-25	26-35	36-45	46-55	56 or older	
<u>Education completed</u>	Masters degree or above	Bachelors degree	+2 or proficiency certificate level	SEE or SLC	Basic education (class 8)	No formal education
<u>Gender</u>	Male		Female		Other	
<u>Platform of Use</u>	Android		Apple			

국문초록

네팔 전자정부 관행의 이용자 만족도 분석 (‘나가릭앱’의 E-서비스 품질이 이용자 만족도에 미치는 영향에 관한 연구)

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서울대학교 행정대학원
글로벌행정전공

목적: 본 연구의 목적은 '나가릭 앱'의 E-서비스 품질 중 어떤 구성이 사용자 만족도에 더 큰 영향을 미치는지 알아보고 네팔의 E-서비스 품질과 관련하여 사용자 만족도를 분석하는 것이다. E-서비스 품질은 효율성, 시스템 가용성, 개인 정보 보호, 이행, 대응성 및 접촉을 독립적인 변수로 측정했다. 만족도는 기대 확인 이론에 따라 '나가릭 앱'을 사용하는 즐거운 경험과 지속적인 의도를 가지고 분석되었다.

설계/방법/접근법: 필요한 데이터를 수집하기 위해 정량적 접근법을 사용하였다. '나가릭 앱'을 사용하는 네팔 시민들이 인구로 고려된다. 구글 기반 온라인 설문지는 앱 사용자로부터 데이터를 수집하기 위해 질문을 필터링하는 것으로 관리되었다. SAS 소프트웨어를 사용하여 432개의 유효한 응답을 분석했습니다. 제안된 가설을 검증하기 위해 요인분석, 기술분석, 상관관계, t-검정, 다중선형회귀를 수행하였다.

결과: 주요 구성요소 분석 결과를 통해 효율성 및 시스템 가용성 측정을 제외한 모든 질문 항목이 해당 구성요소를 함께 잘 나타낸다. Cronbach alpha(접촉 = 0.902, 프라이버시 = 0.897, 응답도 = 0.858, 효율성 = 0.838, 충족도 = 0.849, 시스템 가용성 = 0.840, 만족도 = 0.888)는 항목의 내부 일관성을 제시하였으며 구성을 잘 나타낸다. 수정된 R제곱(0.628)이 시사하는 바와 같이 회귀모형의 예측자들은 사용자 만족도를 설명하기 위한 적합도가 62.80%로 나타났다.

6개의 독립변수 중 효율성(0.241), 프라이버시(0.141), 성취도(0.328), 접촉(0.255)은 이용자 만족도와 통계적으로 유의한 관계($p < 0.01$)를 나타내었다. 반면, 응답도(-0.038)은 통계적으로 유의하지 않은 부정적 관계를 보인 반면, 시스템 가용성(0.045)은 사용자 만족도와 긍정적이지만 통계적으로 유의하지 않은 관계를 보였다. 표준화된 계수 추정치는 충족도(0.323)가 사용자 만족도에 상대적으로 가장 큰 영향을 미치는 것으로 나타났으며, 연락(0.295), 효율성(0.210), 프라이버시(0.155) 순으로

나타났다. 반면 응답도(-0.042)는 시스템 가용성(0.054) 다음으로 사용자 만족에 부정적이고 가장 약한 영향을 미쳤다.

4개의 대조군 변수 중 연령(-0.099, $p < 0.01$)과 성별(0.117, $p < 0.1$) 모두 사용자 만족도에 부정적인 관계를 보였다. 교육과 이용 플랫폼은 통계적으로 유의미한 이용자 만족도와의 관계를 보이지 않았다. 종합해보면 6개 가설 중 4개 가설이 자료로 확인됐다.

연구의 시사점: E-서비스 품질의 구성요소 6개 중 4개는 종속변수에 있어 가장 큰 영향을 미치는 사용자 만족도와 통계적으로 유의한 관계를 보였다. 사용자의 인식과 만족도는 중립점 바로 위에 있다. 조사 결과는 노년층 사용자와 여성 사용자의 만족도가 낮다는 것을 시사한다. 정부는 여성과 노년층 사용자들이 전자 거버넌스의 주류로 진입할 수 있도록 하는 특별한 활성화 요소와 함께 더 쉽고 사용자 친화적인 서비스를 확대하는 데 더 많은 관심을 기울여야 한다.

키워드: 전자정부, 전자 서비스 품질, '나가릭 앱', 사용자 만족도, 효율성, 시스템 가용성, 개인정보 보호, 이행, 대응성, 연결.

학번: 2021-26741

Acknowledgements

To begin, I would like to express my sincere and heartfelt gratitude to my esteemed academic advisor Professor Na, Chongmin for his insightful guidance and continued mentorship from the very beginning to the completion of this work. Without his expertise and clear instructions, this journey wouldn't have been this smooth. I thank Professor Choi, Taehyon; Chair of the committee and Professor Kim, Byeongjo; vice chair; for their constructive comments and feedback. Their vast wisdom coupled with experience has inspired, encouraged and guided me to the completion of this research task.

This work has been conducted with the assistance provided as research grant by Global Development Institute for Public Affairs (GDI). I would like to appreciate and extend my special thanks to the Director of GDI Professor Jongwon Choi and his entire team for providing me with the platforms to present the findings of this research.

I would like to extend my sincere thanks to Korea International Cooperation Agency (KOICA) and GMPA office for the wonderful assistance throughout the academic journey in Korea. I appreciate the tireless efforts from program manager Ms. Yongmi Lee and her team at GMPA office.

There must an extraordinary thanks to my wonderful batch mates; the brighter heads from around the globe with wonderful stories enlightened me and helped me to deepen and widen my perspectives. This endeavor would not have been meaningful without their continuous support and encouragement. Words are not enough to thank them for memorable and wonderful academic journey in the university.

I am deeply indebted to my family members for their contribution and kind assistance. I could not have undertaken this journey without their unwavering support and encouragement.

Finally, I would like to express my profound gratitude to all the helping hands for their contribution to the completion of this research work and for being a part of this academic journey.