International Journal of Public Administration and Management Research (IJPAMR), Vol. 5, No 1, March, 2019.
Available online at http://www.rcmss.com/index.php/ijpamr; www.academix.ng
ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Gajendra Sharma, 2019, 5(1):80-88

AN EFFECTIVE FRAMEWORK ON ONLINE GOVERNMENT SERVICE FOR SMART CITY

Dr. Gajendra Sharma

Department of Computer Science and Engineering | School of Engineering
Kathmandu University
Dhulikhel, Kavre, Nepal

Abstract

The concept of "Smart City" has gain a vast and wider currency, in scientific literature and international policies since the last two decades. Smart city is relating to future of existing as well as new cities and their development. The purpose of this paper is to introduce the present situation of government of Nepal in online service for smart city on Information and Communication Technology (ICT) perspective. This study explains an outline of the online condition of Nepal Government System, its main concepts, objectives and most common applications. It introduces how the Nepal Government is going to be e-government as a modern evolution of ICT. It presents the experiences of Nepal Government officials, Business sectors and Stakeholders through discussions and questionnaires, since e-Government can be defined as a process of conducting business between the public and the government through the use of automated systems of the Internet network. This study is based on the online service of Nepal Government in relation to e-Government alignment, applying government approach, knowledge management and information sharing barriers. The result of this study presents the combined role of government in public service delivery in one segment of the transformative experience promised by the vision of e-government.

Keywords- Smart City, Scientific Literature, online service, ICT, automated system, Internet, information sharing, e-government.

INTRODUCTION

The term SC "Smart City" (SC) was coined towards the end of the 20th century. It is rooted in the implementation of user-friendly ICTs developed by major industries for urban spaces. Its meaning has since been expanded to relate to the future of cities and their development [1]. SC promote social and technological innovations and link existing infrastructures. They incorporate new energy, traffic and transport concepts that go easy on the environment. Their focus is on new forms of governance and public participation. Intelligent decisions need to be taken at the strategic level if cities want to become smart [31]. Considering cities as entire systems can help them achieve their ultimate goal of becoming smart. Smart cities forcefully tackle the current global challenges, such as climate change and scarcity of resources. A city can be defined as smart "When investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance" [2]. Smart City also refers to: "A city well performing in a forward-looking way

in economy, people, governance, mobility, environment and living, built on the 'smart' combination of endowments and activities of self-decisive, independent and aware citizens" [3, 24].

The objectives of this study is to de ne a concept of online service from Smart government indicators in Nepal and to understand how it can contribute to achieve urban development priorities. In addition, the aim of this study is to develop the framework Online Government Service for Smart City.

A. Research Questions

- What is the status of e-Governance in Nepal?
- Is there any strategy by the Government of Nepal to start Online Service?

LITERATURE REVIEW

While there is no clear-cut definition of SC, they are often described as cities that utilize ICT and other emerging technologies to enhance public advantages and advance the standard the way of living. Smart cities are exceedingly dependent on higher coordination among people, city and business as well as other components in public sector. Technology is a proven catalyst in increasing productivity and financial development, particularly in rural and underserved communities. The utilization of ICT in government and the establishment of an e-government infrastructure help create a business-friendly environment by streamlining the interaction and improving the interface between government and business, especially SMEs. [4, 25]. In spite of the fact that in 2011 just around 9.0% percent of Nepal's populace utilized the Internet, utilization of the Internet in Nepal is developing quickly. The aggregate level of Internet client starting at 2017 is 54%. This figure excessively expanded in 2018 [7]. Individuals are presently taking web as the essential administration of their life. This is the standard inclination now in Nepal, as individuals in urban areas are for the most part found to utilize web every last minute [5].

A. Status of e-Governance in Nepal

1. E-Government Master Plan (2007 – 2011) Review

The eGMP for the Government of Nepal was previously developed by Korea IT Industry Promotion Agency (KIPA) for the years 2007- 2011 [7] (E-Governance Master Plan (eGMP) - IT Professional Forum). Initially, 33 projects were recommended by the eGMP (E-Governance Master Plan (eGMP) - IT Professional Forum),out of which, 8 were selected to be implemented in the first phase of the action plan. They are: Groupware for Government, Government Portal, Enterprise Architecture, National ID, e-Education, Communication Network, PKI and Integrated Data Center [8].

2. *ADB ICT Development Project (No: 38347, Grant#: 0106)* (Information and Communication Technology Development Project)

3. E-Governance Master Plan (eGMP2) for the period B.S. 2072 to B.S. 2075

eGMP2 builds on past work completed for the first eGMP. While keeping in the mind the degree of infrastructure development, HR development and systems implementation, establishing the eGMP2 could be a future project [10, 15]. The eGMP2 is to be prepared for a period of 5 years from B.S. 2072 to B.S. 2075 (2015/016 AD– 2019/020 AD) (E-Governance Master Plan (eGMP) - IT Professional Forum).

For citizens:
The EGMP2 links Government services to citizen demanding for better and more efficient service.

For the private sector and civil society organizations:
The EGMP2 provides places for participation in the Government's development goals and promotes partnerships between private sector and Government in governance.

For government:
The eGMP2 provides a roadmap for implementing e-government programs in order to add value to governance, increase service efficiency, achieve transparent government and create interoperability between government services and departments.

All four criteria must be met for eGMP2 to be successful. Each of the four pillars is holding the balance for eGMP2 as shown in Figure 1.

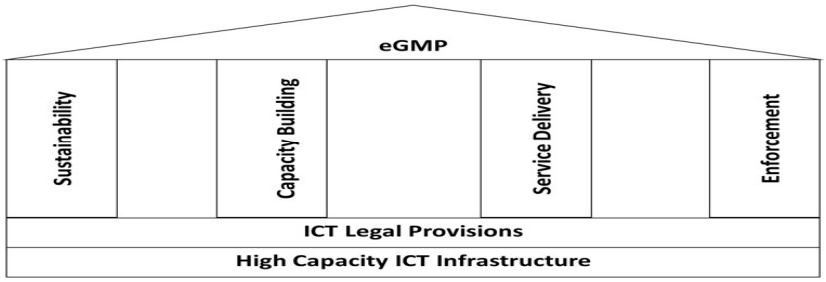

Fig.1 pillars of eGMP2
Source: (E-Governance Master Plan (eGMP) - IT Professional Forum)

B. Various Available Online Government Services

Amongst the various available Online Government Services, some are as discussed as follows [19]:

- Biometric Smart Card (National ID Card)
- Information System
- Public Service Recruitment Management System (PRMS)
- Office of Company Registrar
- National Portal
- License Portal
- Electronic Building Permit System (e-bps) (eBPS)[23]

RESEARCH METHODOLOGY

According to Clifford Woody research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis (Shodhganga) [32, 33].

A. Sources of Data

The research relied on primary in order to come up with accurate findings. The source of the data is Private Company, Municipality and Government organizations in Kathmandu and Lalitpur Districts.

B. Primary Data

Primary data refers to data collected for the first time in the field. Primary data for this particular research was collected using discussions and questionnaires. Discussions were performed with the Government employees, businessmen and general public who participated in the questionnaire.

RESULTS AND ANALYSIS

The findings presented here are mainly based upon the survey carried out through the primary data collection strategy, combined with discussions with the scheduled questionnaire along with the observations are following:

A. An Effective Framework Online Government Service for Smart City Survey

Government Online Service for a smart city is basically the use of ICT and its application by the relevant government body for the provision of information and public services to the people. In simple terms, Government Online Service for a smart city is the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees as well as general public [9, 20, 29, 30]. It is the use of IT to support government operations, engage citizens, and provide public services in a more efficient and transparent manner [12].

1. Survey Category A (Government Officers)

Survey category A focus on the level of use of Government Online Service by government staff. It also tries to show their familiarity with the stakeholder. Not only it shows the availability of software, hardware, maintenance issue related to government office but also it shows the benefit, advantage, challenges and popularity of online service. It can be observed that all the age group participated in the survey [21, 13]. Mostly, the participants are from the age group 18-50. Among them, 44% are from the age of 36 to 50.

Participants' role in their organization: 46% participating Government staff are from the Implementation level, whereas, 22% are from Decision Making level and 24 % are from Planner level. Likewise, only 8% are in other level.
The survey result shows that 95% government organizations have a strategy for Online Service but only 5% government organizations still have no strategy for Online Service yet. This is due to lack of budget and awareness of roles and benefits of ICT. 63% of the Government staff mentioned that Software and Utilities needed for delivering online service are mostly available in Nepal whereas, 26% mentioned, it is easily available in Nepal. 90% Government staff replied that they would develop/ (intend to develop) Online Service applications mostly from local

vendors, where as 8% mentioned would like to develop/ (intend to develop) Online Service applications mostly from abroad. Similarly 34% of Government Offices get support and maintenance services immediately from the vendors on call.
The result further shows that 84% of Government staff thinks, the infrastructure (hardware and software) to implement the Online Service, is Moderate Cost and can be easily managed whereas 15% Government staff replied that, it is extremely costly and hard to effort. In regards to participants opinion, 92% of Government Office work performance has increased when they started using Online Service whereas 8% Government Staff still has a thought that the Online Service has added extra burden their staff. 54% Government staff mentioned that, Government Online Service will serve very well in near future since improvements are being made. *4.1.2. Survey Category B (Individuals and Business Persons)*
Survey category B focus on the level of use of Government Online Service by stakeholders and public members. It also tries to show their familiarity, awareness and usage towards the Government Online Service. Not only the Public satisfaction towards the Government Online Service but also the role of ICT infrastructure for successful e-Government has also been highlighted. The survey results shows that the 43% of participants are from the age group 26-35, 22% and 21% of the participants are from the age group 18-25 and 36-50 respectively. Only 14% of the participants are 50 years and above. It is clear that most of the participants were well educated. 95% participants have the ability to access the internet all time [16]. It was found that 96% of people have access the Government Websites. It shows the readiness of people to take part in online service of the government. 59% of people use Government Online Services 1-3 per time rather than going by themselves whereas 20% of people use Government Online Services 20-30 time rather than going by themselves. But 17% of people use Government Online Services more than 50%.

People use E-Government Service most frequently. Among them are 37% for file taxes, 13% people for births, deaths, and marriage Certificates and 12% people use for commenting on government regulations and programs.

According to survey, 39% of participants agreed that everybody should be encouraged to use Government online services whereas 44% of participants strongly agree for it, only 11% of people are neutral for this. Most people seem to be ready to take part. According to the result, 69% of people agreed that the role of ICT infrastructure for successful e-Government is to get benefits from a new technology; only 16%people are neutral for this. Majority of participants think that there are huge benefits to public if government delivers services online. Government through educational and promotional activities should highlight role of ICT and its benefits. If this happens, people will have trust on government services to reduce corruption.

2. Predictive Analysis

As seen in the survey result of category A and category B an overwhelming 99% government staff used internet among which83% people have ability to access the internet in all-time. 95% government organization have strategy for online services and 96% have taken the actions for starting the online service. These statistics shows that the use of internet among the government staff and people is very high and also shows that government staff, public members and stakeholders make the use of government online service regularly. It saves money, time and corruption.

PROPOSED FRAMEWORK /ARCHITECTURE

This system is based on the data analysis of the survey. We can surmise that the use of Government Online Service as a Smart City does yield an effective result in the field of communication between the government and public. To completely fulfill the need of the government and public, Agriculture Sector would be an ideal solution to know the agriculture unit market prices, retail market price and average market of all districts, province and country according to fiscal year.

A. System Architecture

Figure below shows the proposed architecture for an effective framework Online Government Service for Smart City.

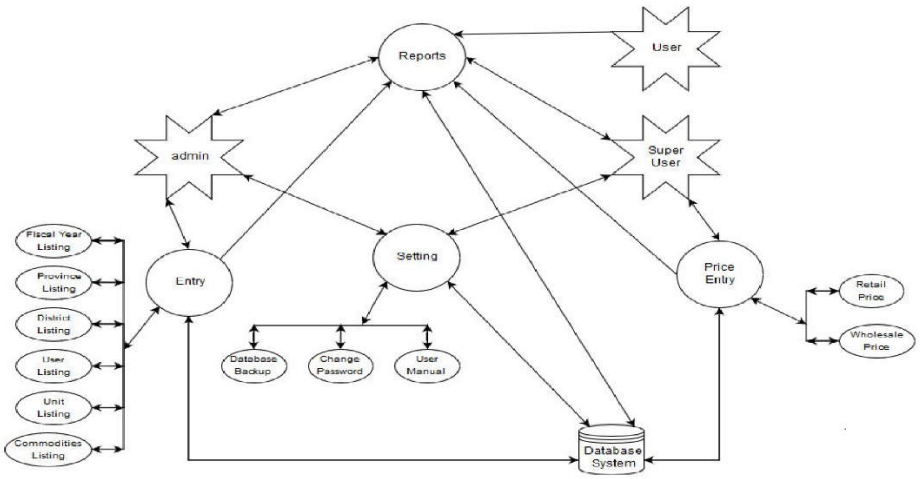

Fig. 2 Proposed architecture:An effective framework online government service for smart city

The proposed system when executed loads with Home, Gallery, Reports and Login modules.

There are various reports available in the system. On the basis of Retail Price and Wholesale Price, Daily Market Price Report, Annual Average Price Report, District-Wise Monthly Average Price Reports of varoius commodities can be generated. Likewise, we can generate National Average Price Report on the basis of Annual Price and Month-Wise Price [21].

B. System Evaluation

The key goal of this section is to discuss the evaluation of the framework. A usability test is one of the most basic methods in usability evaluation, because real test users are asked to use the products.The moderator of the test gives prearranged test tasks one at a time to the test user, who in turn carries out the tasks with the user interface (Neilson, Usability Engineering, 1993). The users concerned during this test had a mix of expertise and skills characteristics. By and large, there have been 5 clients included, whom the researcher feels comfortable although the latest research indicates that testing just four to 5 participants can expose the majority of usability issues (Neilson, Why you only need to Test with 5 Users).

C. Evaluation Techniques

The testing was conducted by monitoring user's performance on watch fully constructed standard tasks in the field in order to collect information about the user's thoughts about the

system. The test used thinking-aloud protocol technique where the respondents were encouraged to vocalize their thoughts, feelings and opinions while interacting with the system. This technique was intended to capture what the participants were thinking including their confusion, frustration and delight.

D. Testing and Results

The system is tested by two groups of users. The first group is a sample of system developer because of their familiarity with similar systems (SD Group). The second group is the sample of administration staff (AD Group). The results of the usability test are elaborated below. Many previous studies found that about five participants are enough to find the majority of usability problems (Neilson, Why you only need to Test with 5 Users). The test used is the IBM's Computer System Usability Questionnaire (Lewis, 1995). The test is divided into four sections:

- System Usefulness
- Information Quality
- Interface Quality
- Overall Satisfaction

1. System Usefulness

SD Group has 94% in agreement that the system is useful and beneficial and 92% of the Ad Group have done the same. In overall, the average of users who agreed is 93%.

2. Information Quality

SD Group has 91% in agreemenet that the system is of high quality content and also 89% of AD Group have done the same. In overall, the average of users who agreed is 90%.

3. InterfaceQuality

SD Group has 94% in agreement that the system is of high quality interface and also 90% of AD Group have done the same. In overall, the average of users who agreed is 92%.

4. Overall Satisfaction

The following figure shows the overall system satisfaction. The average of users who agreed with element of overall satisfaction is 91.7%.

Chart 1 Usability evaluation

LIMITATIONS

The framework of this study does not compare and contrast between quality and usability of framework prepared by government and private sector. It is only a light situation of Nepal Government. This framework is a big & new in the field of IT for Nepal that cannot be fully presented

in the scope of this study. It requires more comprehensive investing time as well as of research. Hence, this research focuses only on the basic concepts and principle of Government Online Service for Smart City.

CONCLUSION

This paper has provided a framework to conceptualize online service for a Smart City. An effective framework Online Government Service has been developed to achieve the objective. After analyzing the information received from the participants and the discussions with them, it can easily be concluded that the government of Nepal is taking initiatives in launching online service as a base for smart city and the resources such as finance, infrastructure, human resource, technological support etc. are in favor of the government to start such a project. According to the results obtained from the survey and the data analysis, Online Government Service is feasible in Nepal. Some work still need to done in order to make the system more functional and reliable This study may be used as a basis or starting point for future research and studies associated with this topic.

REFERENCES

[1] Somayya Madakam and R. Ramaswamy, (2014) "Smart Cities – Six Dimensions".

[2] Andrea Caragliu, Chiara Del Bo, Peter Nijkamp, (2009) "Smart Cities in Europe - International Urban Development Association".

[3] R. Giffinger, (2007) "Smart Cities: De nitions, Dimensions, Performance, and Initiatives".

[4] "Sept. 24, 1979: First Online Service for Consumers Debuts | WIRED," https://www.wired.com/2009/09/0924compuserve-launches/; "The Source (Online Service)," https://en.wikipedia.org/wiki/The_Source_(online_service)

[5] "E-government/Definition - Wikibooks, open books for an open world," [Online]. Available: https://en.wikibooks.org/wiki/E-government/Definition.

[6] "E-government," [Online]. Available: https://www.theguardian.com/global-development-professionals-network/2014/jun/09/e-governance-technology-public-services-development.

[7] "Internet in Nepal - Wikipedia," [Online]. Available: https://en.wikipedia.org/wiki/Internet_in_Nepal.

[8] "Boyd Cohen - Wikipedia," [Online]. Available: https://en.wikipedia.org/wiki/Boyd_Cohen.

[9] Boyd Cohen, Somayya Madakam and R. Ramaswamy, (19 Sep 2012) "What Exactly Is A Smart City?" & (20 Nov 2014) "The Smartest Cities In The World 2015: Methodology"; Somayya Madakam and R. Ramaswamy, (2014) "Smart Cities – Six Dimensions".

[10] "E-Governance Master Plan (eGMP) - IT Professional Forum," [Online]. Available:http://www.itpf.org.np/media/downloads/eGMP%20Report%20Final%20KHINT.pdf.

[11] Information and Communication Technology Development Project," [Online]. Available:https://www.adb.org/sites/default/files/project/document/67852/38347-nep-pam.pdf.

[12] "Information Technology Policy," [Online]. Available: www.sxg.edu.np/wp-content/uploads/2017/11/IT_Policy2067Eng.pdf.

[13] "Electronic Transaction Act 2063 (Nepali Version) - Office of Controller of Certificate," [Online]. Available: http://occ.gov.np/uploads/brochure/2MMBgwr9vN150423061844.pdf.

[14] "Telecommunication Policy, 2060 (2004)," [Online]. Available: https://www.moic.gov.np/upload/documents/Telecommunication-Policy-2060-eng.pdf.

[15] "Ten Year Master Plan (2011 – 2020 AD) - nta," [Online]. Available: http://nta.gov.np/wp-content/uploads/2012/06/10%20Year%20Master%20 Plan%20-%20Draft%201.pdf.

[16] "ICT in Education Master Plan 2013-2017," [Online]. Available: http://moe.gov.np/assets/uploads/files/ICT_MP_2013_(Final)_.pdf.

[17] " न्त्र , ल्ल प्र ," [Online]. Available: http://daolalitpur.moha.gov.np/home/pages/1346.

[18] "Inland Revenue Department - IRD," [Online]. Available: https://ird.gov.np/.

[19] "Personnel Information System," [Online]. Available: http://www.pis.gov.np.

[20] "Public Service Recruitment Management System," [Online]. Available: http://psconline.psc.gov.np.

[21] "Office of Company Registrar," [Online]. Available: http://ocr.gov.np/index.php/np/.

[22] "GoN National Portal," [Online]. Available: https://nepal.gov.np/.

[23] "eBPS," [Online]. Available: http://lsmcebps.gov.np/.

[24] R. P. Pokhrel, Interviewee, [Interview]. 2018.

[25] "Secretariat of the Poor Household Coordination Coordination Board," [Online]. Available: http://poorhouseholds.gov.np/.

[26] "Online Vital Registration (birth, death, marriage, divorce and migration) | Kathmandu Metropolitan City," [Online]. Available: http://www.kathmandu.gov.np/en/node/80.

[27] " ेच्च ," [Online]. Available: http://www.supremecourt.gov.np/web/.

[28] "National Information Commission," [Online]. Available: http://nic.gov.np/.

[29] "Department of Immigration Nepal," [Online]. Available: http://www.nepalimmigration.gov.np/.

[30] " , व्य स्र ," [Online]. Available: http://dolrm.gov.np/.

[31] "Department of Transport Management," [Online]. Available: https://www.dotm.gov.np/en.

[32] Shodhganga, "CHAPTER – III RESEARCH METHODOLOGY," [Online]. Available: http://shodhganga.inflibnet.ac.in/bitstream/10603/7334/10/10_chapter%203.pdf.

[33] J. Neilson, Usability Engineering, San Diego: CA: Morgan Kaufmann, 1993.