PROPOSED FRAMEWORK DEVELOPMENT FOR E-GOVERNMENT IMPLEMENTATION IN NEPAL

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ABSTRACT

E-Government is an essential system to disseminate the citizen centric information and knowledge sharing of Government. E-Government is in a growing stage in all developing countries. For the development and Implementation of the e-Government System, the Framework is essential for e-Government system implementtation in all countries. Before the development of e-Government, we should have design and develop a reliable and usable framework to reduce the gap of design and reality. So, this paper has been suggested E-Government Citizen Centric Framework for Government Citizen Centric Services (GCCS) which is a reliable and a better framework for the Government of Nepal and other developing countries to implement effective and efficient e-Government. In the context of Nepal, the e-Government Implementation System is in pre-matured stage. This research paper has produced a flexible implementation system framework suggest to measure the solid (tangible) and intangible benefits of e-Government to gain the matured stage.

So, this research proposed a very reliable Citizen Centric Service Oriented Architecture (CCSOA) for the e-Government Implementation, which is a Framework. In the context of Nepal, e-Government Implementation is very far stage for the development and public information transformation. So, this paper has suggested a reliable framework of e-Government Implementation in countries (developing and least developing countries).

KEYWORDS

e-Government, Framework, CCSOA, Verification, Challenges, System

INTRODUCTION

E-Government pass on to delivery of required national, regional, district and local information and Government's services through internet, intranet with the help of web services. Nepal is in primitive stages to develop and implement e-Government for information dissemination to the citizens, businesses and other stakeholders. So, e-Government facilitates provision of relevant all

kinds of information in e-Form (Digital Form) to the stakeholders that are Citizens and Businesses in a regularly and timely manner or approaches as well as empowerment of all citizens (Zakaria I Saleh and Rand A. Obeidat., 2013). According to Beijing E-Government Vision and Framework, the overall technical framework of Beijing E-Government is displayed E-Government access channels, E-Government portals, Applications of E-government, unified application support platform for services. This service mainly targeted at enterprises, the public, government and civil servant etc. (Beijing Municipal Office of Informatization, 2004). The India framework is far different from other countries. It is more complex with multi-tier constitution of departments or Government agencies at central, state and local level. The proposed framework is a Government Enterprise Architecture Framework (GEAF) for India; intend to deliver integrated e-Government services to its stakeholders. The framework aims the seamless exchange of data and information between Government agencies in different geographical locations across India by means of the e-Government Interoperability. There consists five main entities of the framework are Stakeholders, National Portal, Service Providers, Architectural Domains and Service Delivery Gateways. The framework for e-Government Interoperability leads to a Service Oriented Government Enterprise Architecture (SOGEA) in Indian Perspective. This SOGEA uses two layers that are Business Service Layers, Service Integration Layer (A. Paul and V. Paul, 2014). The framework for Palestinian e-Government Central Database have used only four layers that are Presentation Layer, Integration Layer [including Orchestration, Registry and Metrics and messaging], Service Layer [including Information Services, Replication Services and Security Services] and Database Layer [including Data Access Services, List of Procedures, Diverse Database Types, Integrated Central Database and Ministries Database, Accesses Database through predefined procedures previously defined database operator]. The Central Database model in the Palestinian e-Government technical framework lacks are Interoperability, Flexibility, and Manageability (S. Madoukh and R. Baraka,. (2014). The service oriented e-Government architecture provides the efficient and transparent governance to citizens. So, the mapping service oriented architecture in e-Governance plays a effective role for the development and design the e-Government Framework using different layers to desiminating the government informations to citizens (S. Nirmala Sugirtha Rajini and T. Bhuvaneswari. ,2012).

FRAMEWORK

The development technology trend in e-Government implementation is a part and the rights of citizens to transform government services using ICTs in the context of Nepal. The materialization of information, communication and technology (ICT) that has been provided government services for high speed, efficient and better communication of public information's means the processing of data, exchange and utilization of all kinds of information that are based on citizen centric. So, electronic government has established as a very fast and effective technology and also a mechanism for growing government productivity and efficiency, which mechanism used to provide services to the citizens (citizen centric services). This research attempts to identify and explores the major or key challenge which is influencing for the implementation and development in Nepal, factors make a failure country in e-Government system in Nepal.

So, the purpose of this research is to develop strategies and frameworks for the development and implementation of e-Government services in Nepal and other developing countries which are facing such kinds of problems. They can have used this research as a guide/a manual. This research's solution or output helps to reduce the gap between reality and design. For adopting of e-Government system the research has proposed the solutions (Framework) that are the better, effective and efficient solutions.

So, the results of this research are validated. Verification findings of this research study provide the frameworks for the development and implementation of the e-Government system.

The following are the validate outcomes which came from verified findings. The proposed e-Government Implementation System Framework is the validated outcome these are e-Government Strategy, e-Government Relationship, E-Government Delivery Framework, E-Government Domains, E-Government Connectivity, E-Government Interoperability Frameworks (e-GIF) and e-Government Implementation System Framework. The frameworks become from verified challenges which would be the best and necessary outcome of the implementation of e-Government. The combination of following components provides a strong and effective e-Government Implementation framework which framework shown in figure 3. That are:
Proposed e-Government Strategy,
Proposed e-Government Relationship,
E-Government Delivery Framework,
E-Government Domains,
E-Government Connectivity,
E-Government Interoperability Frameworks (e-GIF): Policies, business drivers and technology,
e-Government Ineroperability Framework (eGIF),
e-Government Application Model.

This research develops the efficient and strong a conceptual framework in the context of Nepal the conceptual framework has framed on the basis technological aspect, which gives a strong and permanent system framework for the establishment and implementation of e-Government system in Nepal. Therefore, this research has identified factors which determine if the citizens will adopt e-Government services, it means adding Governments in accessing that is required for adoption. This research highlights "No System Designed (83.33% weight has scored". So, in the context of Nepal No system design makes by the use of software engineering process for the development of the e - government system. This e-Government Implementation System Framework provides a better solution to develop e - government implementation system

and to increase public participation use of e-Government.

e-GOVERNMENTS DELIVERY FRAMEWORK FOR INFORMATION PROCESSING AND ACCESSING SYSTEM

e-Government delivery framework for information processing and accessing is a system which has considered into e-Government Implementation System Framework. This framework considers two layers that are Access Layer and Application Layer which has been used for corporate collaborate and integrate information across different ministries, departments in the center, regional, districts, and villages. So, it is an information gateway of e-Government service delivery. This framework provides system flexibility, accessibility and security shown in figure 1.
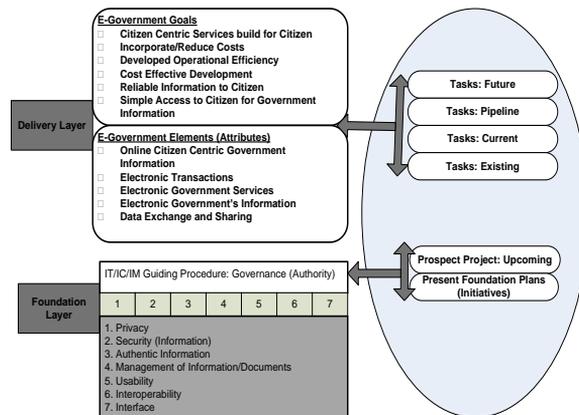

Figure 1. e-Government Delivery Framework for Information Processing and Accessing System (Government).

In the context of Nepal, the Government can be considered this framework for e-Government Implementation System framework; e-Government Master Plan (e-GMP) has not considered this framework component to deliver services to citizens. This framework has two layers that are:

1. Foundation Layer (denoted by a capital A) - Consists two entities – e-Government Goal and e-Government attributes associated with the Project (future, pipeline, current and existing) – denoted by Capital P1.

2. Delivery Layer – (denoted by a capital B) - Contains an entity that is e-Government attributes associated with a prospect project and present foundation plans – denoted by capital P2.

The mathematical relationship of two layers with their sets:

$$[A ® P1] \cap [B ® P2] € S$$
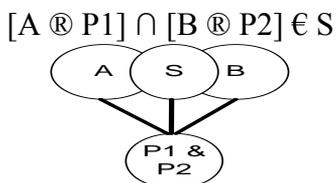
P1 is the specific set of A and P2 is another set of B, such as P1 and P2 are then connected with S. So, it is called multilevel framework. Both A and B are associated with each other to process the information and accessing system that is S. This relationship considered into e-Government Implementation System framework of Access Layer and Application Layer.

e-GOVERNMENT SYSTEM ARCHITECTURAL STRUCTURE (eGSAS)

This research paper provides or recommends the following structure of the e - Government System. The eGSAS helps the Government to implement an e-Government system that holds to e-Government rules and strategy; ensured that e-Government environment which can have good and effective e-Government implementation framework design. The implementation of the e - government system has structures to transfer information and data which show the different levels for the implementation of system for government services. The following figure 2 depicts the architectural structures which have used for the implementation of this structure using e-Government Implementation System Framework.
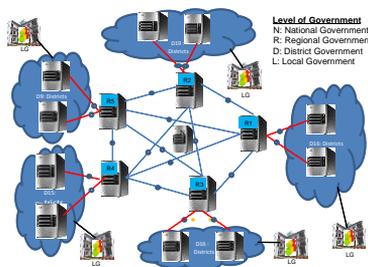

Figure 2. Proposed Architectural Structures of the e - Government System.

Nepal has 5 regions and 75 districts and many villages and cities are situated in this country. By the statistical non-parametric method the research proves the illustrated architectural structure of the e - government system that is the connectivity of five layers of contains elements which is:

N, R, D, L => S (System)
Here,   N = National Level Government;
        R = Regional Level Government;

D = District Level Government;
        L = Local Level Government

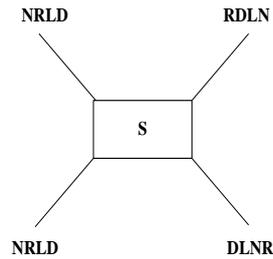The structure of connectivity of the architectural structures, layers elements or entities.

Table 1. National, Regional, Districts and Local Government.

National Government	Regional Government	District Government	Local Government
N2N,	R2R,	D2D,	L2L,
N2R,	R2D,	D2L,	L2N,
N2D,	R2L,	D2N,	L2R,
N2L	R2N	D2R	L2D

The group elements of connectivity:
NNNN NRDL RRRR RDLN DDDD DLNR LLLL LNRD

The sequence of connecting elements is:
N, N, N, N, N, R, D, L, R, R, R, R, R, D, L, N, D, D, D, D, D, L, N, R, L, L, L, L, L, N, R, D
The connectivity of elements would use the following symbols, they're contained four occurrence elements layers.

        $\mu1=N$, $\mu2=R$, $\mu3=D$, $\mu4=L$
Therefore, $\mu1=8$, $\mu2=8$, $\mu3=8$, $\mu4=8$

In this case the values of $\mu1$, $\mu2$, $\mu3$, and $\mu4$ must be operates 8 times, accessibility for efficient and effective e-Government implement-tation nationwide. The research shows the five layers elements of the given architecture. The architecture of an e - government system has equal participation and the same range of connectivity and accessibility.

So,   System (S) =
        $\{\mu1\leftrightarrow\mu2\leftrightarrow\mu3\leftrightarrow\mu4\}\ldots$ (1)

This equation (1) allows to access and transformation of information by citizens because all elements of

layers are connected to each other. It can prove that:

{N belongs to RDL}, {R belongs to NDL}, {D
belongs to NRL},{L belongs to NRD} U System
=N{R,D,L},R{N,D,L},D{N,R,L},L{N,R,D}
= {N} + {R} + {D} +{L}…   … (2)

Therefore, S= {NRDL} All layers of elements have the same relationship which allows for transformed information from N entity (element) to L entity (element) which has existed in mentioned layers.

RECOMMENDATION OF E-GOVERNMENT IMPLEMENTATION SYSTEM FRAMEWORK

For the development of e-Government System must have a framework for implementation of e-Government framework provides a uniform or homogeneous set of software apparatus for the new development and running e-Government applications. All the developed and some developing countries are applying the e-Government system framework for effective operations of application for dissemination of government services and required information to citizens using different framework layers. This framework provides general elements and set of the usual templates which are naturally required to implement or developed a system, reduced replica (duplicated) work. Basically, the system framework has expected to help or support member areas or locations for saving time and cost in developing the new e-Government applications.

So, the e-Government development is frequently defined in different context and from various perspectives. This has been controlled processes which should have implemented right-through the entire structure of public administration. E-Government framework is a process which builds or generate methodlogical, technological, organizational and personnel conditions for the efficient and effective application/purpose of ICTs in public and government administration, and a controlled process of ICT application. In the context of Nepal no have such kind of e-Government framework build for the development of the e -Government System. The e-Government System Framework should have developed or construct on the basis of country's geographical infrastructures. So, this research proposed the constructed e-Government System in the context of Nepal. So, based on the collected data analysis and verification the research presents a modern citizen centric information based e-Government framework for effective and efficient implementation of government e-Services. Therefore, this research suggests the following types of e-Government System framework which has permeated systematic approach in taking all plans, idea and

scheme in the modern cloud based e-Government implementation. The e-Government framework consists of five elements layers which has shown in the figure 3 below. In this figure 3 upper section layer which is access layer consists of user of e-Government Services, Receiving and Sending Channels that is data and information communication devices. Second section of layers which is e-Government Layer consists of Portal for information that is Government Integrated sign on portal. Third layer section is the application layer consists of processing application with an interface. In the fourth section of the layer is Information and Data System layer consists of Government Data sources through different organizations. Such as in fifth section or lower layer which is Infrastructure layer consists of information dissemination network infrastructure that is a foundation which has used to process and transformation of information in the access layer of user of e-Government Services sending and receiving sections.
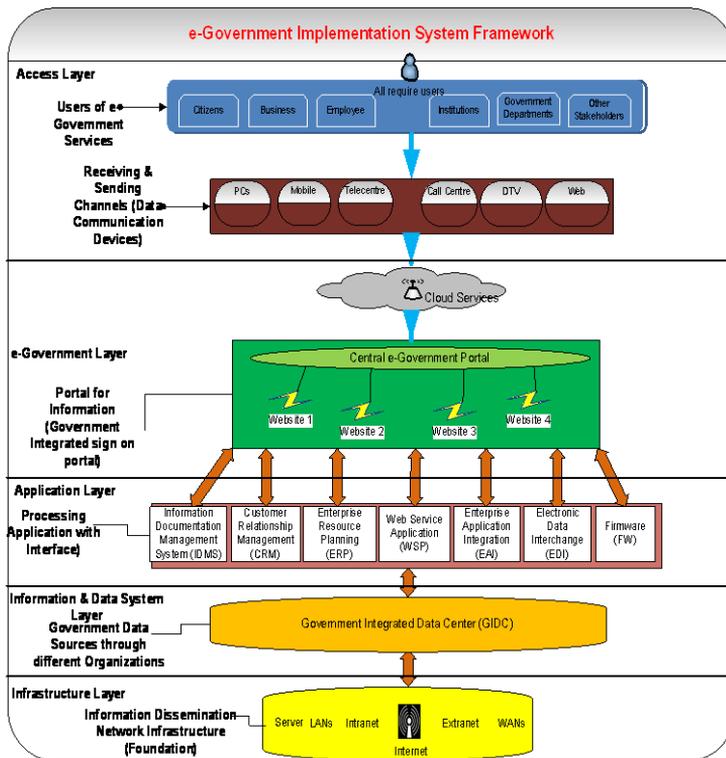
Figure 3. e-Governments Implementation System Framework.

There consist of following five layers in e-Government

Framework Layer: Access Layer

Variable: Citizens, Business, Employee, Institution, Government, Departments, Others Stakeholders

Medium: PCs, Mobile, Tele-center, Call Center, Digital Tele-vision (DTV), Web

Framework Layer: e-Government Layer

Variable: Central e-Government Portal, Number of Websites

Medium: All Citizens and Stakeholders

Framework Layer: Application Layer

Variables: Information Document Management System (IDMS), Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), Web Service Application (WSA), Enterprise Application Integration (EAI), Electronic Data Interchange (EDI), Firmware (FW)

Medium: Data System Database and Data warehouse

Framework Layer: Information and Data System Layer

Variables: Government Integrated Data Center (GIDC)

Medium: Government Data Sources through different organizations

Framework Layer: Infrastructure Layer

Variables: Server, LANs, Intranet, Internet, Extranet and MANs

Medium: Networks

On the basis of the e - Government System, IT is enabling administrative process between Citizen and Government (G2C), among Government Institutions (G2G), Government and Business (G2B) which presenting the given figure 4.

1. Access Layer: Includes two variables that are Government Users (Recipient of Government Services) and Data communication Devices (Channel/ Medium). Government users can access the various types of services using data communication channel or devices. Government service users are citizens, businesses, employee, institutions, Government Departments and other stakeholders. Service medium or channel that has been using services access point are PCs, Mobile, Tele-center, Call Center, DTV, Web. Access Channels are critical components of e-Government.

2. E-Government Layer: Portal for information dissemination. Includes number of websites known as a web portal. So, this layer uses for integrating digital data of various organizations into a web portal. This has been used to provide the highest quality of services, better access to Government resources, So, it enables to provide all kinds of better services to users.

3. Application Layer: Processing Application with Interface. Consist various Information Technology and processing component applications which have used data processing and data integration. The main functions of being layer are knowledge sharing and information processing using ICT applications and tools. This layer makes a strong base to construct e-Government Portal which is mentioned in e-Government layers. It provides real time communication between systems at both data and process level. Information Document Management System (IDMS), Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), Web Service Application (WSA), Enterprise Application Integration (EAI), Electronic Data Interchange (EDI), Firmware (FW) is included.

4. Information and Data System Layer: It is a Government Data Source has managed through different organizations. The main variable is Government Integrated Data Center (GIDC) which should have established with different organization's data and information domain sources. All citizen centric information stored into this integrated data center. By the functions of this center users can access the citizen centric government services

5. Infrastructure Layer: Information dissemination network infrastructures that are foundation of e-Government Implementation System, which have shown in figure 3. Building an information of nation requires information communication technology infrastructure which can flow and communicate all needed information to citizens and other stakeholders. So, this layer mainly focuses on technologies that should have to build before e-Government services offered. Server, LANs, Intranet, Internet, Extranet and WANs are the variables of this framework's Infrastructure (Foundation) layer. The information dissemination medium is Network.

Figure 4. e-Government IT enables administrative process**.**

This figure 4 shows the transactions between citizen, government and business for communication of information that are G2C , G2G and G2B. This system framework covered the following types of government services that are G2G, G2E, G2I, G2B, and G2C. The use of figure 3 e-Government Implementation System Framework provides the structure for the implementation of citizen centric informatics e-Government shown in figure 2

CLOUD COMPUTING

Cloud Computing has been developing today as a commercial infrastructure that eliminates the need for maintaining expensive computing hardware. Through the use of virtualization, clouds promise to address with the same shared set of physical resources a large user base with different requirements. Thus, clouds promise to be for scientists an alternative to clusters, grids, and supercomputers (Simon et al., 2010). Cloud Computing is emerging rapidly, with its data centres growing at an unprecedented rate. However, this has come with issues over privacy, efficiency at the expense of resilience, and environmental sustainability, because of the dependence on Cloud vendors such as Google, Amazon and Microsoft. Community Cloud Computing (C3) provides an alternative architecture, created by combing the Cloud with paradigms from Grid Computing, principles from Digital Ecosystems, and sustainability from Green Computing, while remaining true to the original vision of the Internet. It is more challenging than Cloud Computing, having to deal with distributed computing issues, including heterogeneous nodes, varying quality of service, and further security limitations. However, these are not undefeatable challenges, and with the need to retain control over digital lives and the potential environmental consequences (Marinos and Briscoe, 2012).

Cloud Computing is the implication of Internet-based technologies for the demand of services originating from the cloud as a metaphor for the web, based on depictions in computer network diagrams to abstract the complex infrastructure (Haynie, 2009). It can also be observed as a commercial evolution of the Grid Computing, succeeding where Utility Computing struggled, while making greater use of the self-management advances of Autonomic Computing. It facilitates the illusion of infinite computing resources available on demand, with the elimination of upfront commitment from users, and payment for the use of computing resources on a short term basis as per the requirement (Armbrust et al., 2012). Three categories of cloud computing services were identified: Infrastructure as Service (IaaS), which is raw infrastructure and associated middleware, Platformas-a-Service (PaaS) , that is, APls for developing applications on an abstract platform, and Software as a Service (SaaS), which is support for running software services distantly. The scientific community has not yet started to adopt PaaS or SaaS solutions, primarily to avoid porting legacy applications and for lack of the needed scientific computing services, respectively. Unlike traditional data centers, which lease physical resources, most clouds lease virtualized resources which are mapped and run transparently to the user by the cloud's virtualization

middleware on the cloud's physical resources. For example, Amazon EC2 runs instances on its physical infrastructure using the open source virtualization middleware (Barham et al., 2003).

CONCLUSION

In this research paper, propose an effective (successful) e-Government Implementation System Framework. The research paper provides detail layers which include in the proposed framework. In the framework includes five layers that are Access Layer, e-Government Layer, Application Layer, Information and Data System Layer and Infrastructure Layer and their functions. Nepal Government can be used this framework to establish the effective and efficient e-Government System to provide the citizen centric services for the peoples and businesses. Because, Nepal has very complex administrative structure, consists four government components that are National (Central), Regions, Districts and Local Level Governments.

Nepal Government and other Developing countries can be applied e-Government Implementation System Framework for the implementation of e-Government for the providing of Government services. So, the e-Government System Framework is the most important challenges for development and

implementing the e-Government to disseminate the citizen centric services.

Without appropriate designed of e-Government System Framework, it is not possible to implement the citizen centric e-government system in Nepal and other developing countries. At First it is necessary to have a strong and appropriate designed e-Government System Framework with efficient ICT infrastructure to implement e-government. The research basically recommended the model and framework which are the validated outcome. According to model and supported frameworks develop an e-Government Implementation System framework. The proposed framework strongly recommended Implementation sys-tem. The future work will be the establishment of e-Government based on e-Government Services incurporation in the e-Government Sys-tem.

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