

A Reengineering based Framework for Integration of e-Governance Portal of Various State

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Abstract: One of the most important purposes of e-Governance is to increase the satisfaction level of citizens. A single window system often helps in great way to access various government services. However, many e-Governance portals lack in integration and interoperability. Often individual state/local governments use their own portal for providing various e- services to its citizens which at times require integration and coordination with similar portals of other states for the information sharing. Lack of this feature restricts the usages of services. The realization towards this came from our previous case studies of two such portals (namely SPST and Jansunwai) of the state of Uttar Pradesh to understand the issues therein. This paper presents a general framework and guidelines for e-Governance which may be considered for implementation to overcome the existing limitations identified during the period of this study and research. The roadmap shown can improve the services, scope and functionality of certain portals. Central to this skeleton is the interconnection and integration of similar e-services being offered by different government in the country.

Index Terms: e-Governance, SPST, Jansunwai.

1. Introduction

e-Governance is fast becoming key to the success of any government in providing fast, transparent and affordable services to citizens [1, 2, 3]. The expansion and affordability of Information and Communication Technologies (ICT) has made it easier for the governments to launch and implement new projects [4, 5, 6]. Accessibility of public services on a single platform is also important [7, 8, 9]. The interconnectivity and interoperability with other systems should be a key to successfully provide comprehensive services to all at one place [10, 11, 12].

We are living in the information and knowledge age where everyone needs fast and efficient services, so the organizations have increases online services, while taking care of data security measures [13, 14, 15, 16].

Realizing the powers of e-Governance, governments have taken many initiatives to provide e-services through possible combination of other similar service to utilize shared information in order to optimize the government services. [17]. Sharing of information safely has become easier due to technological enhancements [18, 19].

Designing an interoperable e-Governance systems are though complex due to involvement of center, states and various other sections/department which may have been using heterogeneous system, data, and processes [20, 21]. However, due to emergence of new technologies as stated above, development of distributed architecture for e-Governance consisting of one-stop operation has become possible [22].

The rest of the paper is organized as follows: Section 2 comprises of brief information about previous work. In Section 3 we present summary of Case Studies of two Portals: SPST and Jansunwai Portal. In Section 4 & 5 describes Requirement of Interconnection of Portals & Business Process Reengineering (BPR) respectively. In Section 6 we propose the architecture and also describes the working each sub processes. Finally, paper concluded at section 7.

2. Previous Work

We have explored some of the relevant literature to discuss studies related to e-Governance models, design, architecture etc. based on integration and other requirements that may have been felt time to time. Following is some of the most prominent contributions to provide the framework and architecture for various e-Governance based projects and has been the guiding factors for our model. Our previous works on detailed analysis of two U.P. Government portals (briefly described in the next section) have also motivated us to further explore other architectures in order to present our framework.

In 2007, M.M Lankhorst et al. described the demand driven architecture for e-Governance to satisfy the user requirement. It integrates the e-Governance services of Government & private agencies [23].

In 2013, K. A. Sedek et al. states about the e-Governance services provided by Malaysian government to citizens, businesses and tourists. Each agency has its portal but lack in integration and interoperability. They proposed an architecture called MyOneEG (Malaysian One-Stop E-Government) using distributed hybrid approach to integrates various services [24].

Ajay et al. (2017) worked on integration of e-Governance services at state level and central level. They proposed Services Oriented Architecture (SOA) for integrating the census data. This architecture contains three layers: Web Service Provider, Service Broker and Web Service Consumer [10]. This work helps in e-Governance for issuing caste and rural certificate [10].

In 2018 Ajay Kr Bharti et al. applied the BPR (Business Process Reengineering) approach on public transportation. Their model included the National e-Governance Plan (NeGP) to deliver the integrated and quality services to Indian citizens [25].

In 2019, Meriska & Mochzen, designed an architecture for Purwakarta Districts for e-Governance. It was based on Federal Enterprise Architecture (FEA) using Collaborative Planning Methodology (CPM) which integrates six domains: strategy, business, data, application, infrastructure, and security [26].

The works cited above along with few others in the literature have presented various models and integration of work as per the requirements of services. The services provided in e-Governance based systems are usually related to a set process being followed to provide information. From integration point of view. Sometimes it requires efforts to integrate with other services which may have complex integration [27]. Going through the literature, there are approaches proposed which aimed to enhance e-government systems with good interfaces for the users. It is therefore need of the hour towards collaboration and integration of various public services so that the typical user requirements may also be fulfilled [28, 29, 30].

3. Summary of Case Studies: SPST & Jansunwai Portals

3.1. State Public Service Tribunal (SPST)

In recent years cases in court are increasing constantly on different issues. This creates various issues such as pressure on employees of court, delay in cases, loss of money and time. To resolve these issues Uttar Pradesh government established State Public Service Tribunal (SPST) on 24th Nov 1975. Currently, the SPST portal looked the services matters of UP government. Through the portal, public servant can file a petition on various service matters [31].



Fig.1. SPST Portal

After analyzing the SPST portal, we developed the questionnaire containing 50 questions. The purpose of questionnaire was to identify the general issues in developing e-Governance & obstacles in SPST portal [50]. The questionnaire was filed by the people of government employee & private sector employees of different age groups, genders. Participants were mainly from Lucknow, a few were from other state as well [32].

Among the main findings of this survey are the following-

- 1) Though around three fourth of the respondents were generally satisfied by general handling by this portal, one fourth were not very satisfied.
- 2) More than 70 % of respondents were of the opinion for interconnectivity of SPST portal with similar portals of other states for better user satisfaction and services as there could be many cases wherein and which may require information from the other states as well. This is a very important outcome which has helped us understand the need of interconnectivity and integration.
- 3) The claim satisfaction level through the portal was not very encouraging as only 11.4% of the total participants were highly satisfied whereas around 43% were not satisfied with the claim settlement process. This is one of the most important outcomes of the survey as the purpose of portal is getting defeated to some extent.

Based on the above outcomes, our discussions with the participants and their suggestions, we found some very common possibilities and issues that may happen with any individual using SPST-

- 1) Transfer of service matters to other state like promotion, enquiry, LTC etc.
- 2) Integrity related issues
- 3) Vigilance enquiry etc.
- 4) Past service counting related matters
- 5) Service book related matters

These cases have led to the possibility of interconnecting the SPST portal with other similar portals where from one can get desired and concrete information.

3.2. Jansunwai Portal

The Government of Uttar Pradesh has made serious efforts to address the public grievances of citizens related to various sections, departments and officials of the state. It has come with the complaint redressal framework for a severe complaint removal mechanism.



Fig.2. Home Page of Jansunwai

Jansunwai-Integrated Grievance Redressal System (IGRS) of Uttar Pradesh is a unique initiative towards the compelling and effective removal of the complaints for the positive change of the general public which drives the state of Uttar Pradesh to a progressive and successful state in e-Governance implementation [33, 34].

The department of administrative reforms and public grievances launched the IGRS in 2016 for receiving, redressing and monitoring of grievances from the public. This portal facilitates any one to register a grievance anytime while sitting at home. It also enables them to track the status online [33].

Similar to the previous portal in our discussion, we developed a questionnaire comprising of 50 questions. The purpose of questionnaire was to identify the functionalities, satisfaction level of users and review to know more about possible suggestions for any improvement.

A total of 200 persons (with varying social/demographic profile) participated in survey conducted mainly in and around Lucknow (the capital of state U.P.) After the detailed analysis of survey results, some of the key findings are:

- 1) Poor network infrastructure and internet bandwidth, digital divide, illiteracy and poor financial status of many individuals restricts the access and creates hurdles in popularizing the usages of portal.
- 2) Grievance redressal mechanism in Jansunwai is the most important part of this portal, which is in general satisfactory, but delayed settlement and disposing the grievance abruptly requires attention.
- 3) Interconnection/ Interaction between states is less- it's an integrated system for U.P., However integrating it with similar portals of other state may also be considered so that persons residing in other state may also settle any pending grievance which may require attention/information of both the states.

4. Requirement of Interconnection of Portals

In the previous section a brief description has been provided about the two portals we have considered to review. The analysis of the survey results reveals some issues with these portals as outlined in the section. Apart various states having similar characteristics and functions. As these portals are specific to the state of Uttar Pradesh, several instances as stated also require the state specific portals to interact with some other states for getting essential information to process the case of any individual. For this an integrated framework will be required to process any required workflow among states and the Centre. We have followed Business Process Reengineering (BPR) model to propose our integrated framework for the e-Governance application.

5. Business Process Reengineering

As we realized among other issues the interconnection / integration of certain portals, Business Process Reengineering (BPR) is a standard methodology used for imperative changes or improvements a business process or system or exhaustive transformation of such process [35, 36, 37]. It means BPR methodology has the capability to relook at the system to make revolutionary changes in it to make it cost effective, fast and better in terms of quality of service [38, 39]. Inputs (customer inquiry), Process of data and Output are the three main elements of BPR.

5.1 Need of Reengineering

The aim of reengineering of certain e-Governance projects is to remodel the existing government process so that they should be agile and flexible to provide better services to its people. As a result of it that their social and economic conditions may improve significantly. The main reasons to identify the need of reengineering could be the following.

- 1) Dysfunction: A good e-Governance affected by various issues such as limited inter-connectivity, lack of communication, lack of online services etc.
- 2) Globalization: it is fast becoming a global trend now to interconnect applications for maximum gains, due to this exemplification changes in design and/or technology, have become obvious for many governments to cope with the trends for to provide quality experience to people.
- 3) Competitions: Service sector is facing heavy competition from various stake holders; it is therefore duty of the government is following facilitator-enabler-regulator kind of approach to ensure transparent and effective services with integrity.
- 4) Good Governance: The government under National e-Governance Plan's (NeGP) focuses on up-gradation of e-Governance infrastructure such as Statewide Area Network for wider publicity. It therefore requires that many present services being offered by various states need to be analyzed time to time to incorporate and adopt all new dimensions of governance.

Certainly, existing systems need to be more efficient, more competitive and more accommodative. It should also be robust in design so that interconnectivity issue need not be a hurdle for anyone.

o Applying BPR

In a business or governance related environment, BPR aims to change strategy, process, technology, and culture to attain SMART (Simple, Moral, Accountable, Responsible and Transparent) Governance. The reengineering helps in remodeling the processes to make them more effective and satisfying to the public.

The essential steps of reengineering toward our objective are:

5.1.1 Identification of process for redesign

As the purposes of the two portals, SPST and Jansunwai, the services are identified in under following categories.

- 1) *Government to Government (G2G)* - both the portals offer service under this category as it is for the interoperability between different levels of government. For example, for any inter-state service, states can interchangeably inquire any particular information from the portal of other states.
- 2) *Government to Employee (G2E)*- services are tendered to its employees by any government, such as payrolls and their liabilities such as taxes. The portals under our consideration also provide these services.
- 3) *Government to Citizen (G2C)* -It is the most common service being offered by the two portals.

In case of interconnection/integration requirements the process boundaries and the scope have to be redefined

5.1.2 Developing process visualizations

Process visualization gives a proper action to envision the desired (To-Be) process in a proper way to achieve its advantage. Though process visualization has been done in both the portals and has been explained also, certain changes may make them more effective, specially whether certain issues have been identified. For example, the claim settlement process of SPST needs to be revisited. Further the interconnection requirements may also require modifying various processes. The model as shown in figure 3 visualizes the blueprint to refine and streamline the process.

5.1.3 Awareness

It is the key to success of any good initiative and has also been identified in our study; a high level of awareness is needed from the governments to gain maximum benefit of any new service.

5.1.4 Infrastructure

The NeGP has given the systematic plan for the growth of e-Governance projects across the country and states. The digital India initiatives government has taken many steps to boost the infrastructure and security in the country, for example Aadhar based identity platform, Bharat broadband Network Ltd. (BBNL) to create National Optical Fiber Network(NOFL) mainly in villages, IoT, CERT to secure Indian cyber space. These plans will definitely boost ICT infrastructure in the country and cyber security aspects.

5.1.5 Capacity Building

It requires great efforts and dedication for building such a nationwide infrastructure to handle common integrated approach. Any Conflicts or issue so arising between states and the central have to be properly and timely settled promote interoperability at state and central level. Institutions like NIC (National Informatics Centre) may play key role in integration and implementation.

5.1.6 Interoperability

It has already been highlighted that SPST and Jansunwai can be extended to have interoperable and interconnected environment for even better services. NICNET of National Informatics Centre (NIC) and the Statewide Area Network (SWAN) may provide interconnectivity between states.

5.1.7 Evaluation

For all e-Governance projects, certain standards have to be set for key performance indicators for any new framework or model being proposed. Projects should be evaluated on the basis of following.

- 1) Cost of planning, development, deployment and regular maintenance.
- 2) The tenable of projects over an extended period.
- 3) Success of an e-Governance project to be studied on the basis of the quality of service it provides, and its reliability.

5.1.8 Pilot Project

The SPST and Jansunwai projects are already under running state and are being used by many. The new framework proposed in this work is mainly due to interconnection issue as realized through our study. So there may not be any requirement towards pilot project in case they are reengineered and implemented.

5.1.9 Understanding the existing processes

It has already been done extensively and the issues have been identified and discussed in section III. Based on that need for interconnectivity of the similar portals and possible integration has emerged.

5.1.10 Redesigned Process

Considering identified processes to be redesigned and understanding the process visualization of existing processes, a generalized model for implementation various portals has been proposed in Figure 3.

The above-mentioned efforts of government of India towards a building national level infrastructure will definitely support proper access to all such projects in India. At present, a number of portals of different states similar to SPST and Jansunwai of U.P are running on different computer networks to give access to their citizens. This restricts the inter-connectivity and interoperability of these projects to be able to be accessed on a network of other state and hence the expansion opportunities using a common networking platform such as National e-Governance Service Delivery Framework [NSDG] [40, 41, 42, 43]. The interconnectivity between portals of different state can be performed using Central Portal (as shown in figure 3). The interconnectivity between State, District and Block headquarters of state are also performed using State Wide Area Network (SWAN) [44].

6. Proposed Model

In order to have a better useful experience of e-Governance services in India, dedicated fast and extensive networking infrastructure is highly required. Realizing it, the government of India has already engaged itself in such mammoth task.

Following the standard steps of process reengineering towards issues specially the interconnectivity and possible integration of various e-Governance modes, a redesigned architecture has been proposed in this section.

6.1. Components of Architecture

The core components of architecture are as follows:

- 1) User: - Any citizen after getting registered and authenticating him/her-self, fires a query on state portal to connect and start communication with the authorities. Proper authentication is done at this level using any centralized database such as Aadhar (or NRC)
- 2) State Head Quarter: - It resolves the user's problem without intervention of district or block head quarters. It is also responsible for transferring problem to lowest level as needed. It may also communicate central government for any help or information and may also fetch information from other states (if needed) related to user's problem.
- 3) District Head Quarter: It solves the users' problems on the basis of instructions received from State government.
- 4) Block Head Quarter: - It solves the users' problems on the basis of instructions received from State or district headquarters of government.
- 5) National Level: - The centralized portal establishes the strong communication between portals of different states. It helps to provide the required data to the needed state.
- 6) SWAN: - As already pointed, SWAN [44] may serve as core infrastructure components under NeGP. This will create dedicated Closed User Group (CUG) network to provide secured and high speed connectivity for Government functioning, State Headquarters, District Headquarters, Blocks Headquarters and even to gram panchayats.
- 7) State Data Centre (SDC): - Government has identified SDC [45, 46, 47] as one of the important elements of the Core infrastructure components to support supporting NeGP. SDC has the key role of a central repository of the state, security and online delivery of services, it also serves the purposes information/service portal, State Intranet portal, disaster recovery, remote management and service integration, among others.
- 8) NICNET: NIC, through its ICT Network, "NICNET", has institutional linkages with all the Ministries/Departments of the Central Government and State Governments/Union Territories [48, 49, 50].

This framework has been a step towards nationalization of SPST and Jansunwai. It may help improve the accessibility of various service through its integrated and interoperable design. It will serve every citizen of a particular state who may have pending service-related issues or other issues in other states may also get proper information immediately. At the same time the concerned officials handling such grievance too may find themselves in a comfortable position by getting all needed information instantly. This will help in resolving the grievance well within time frame.

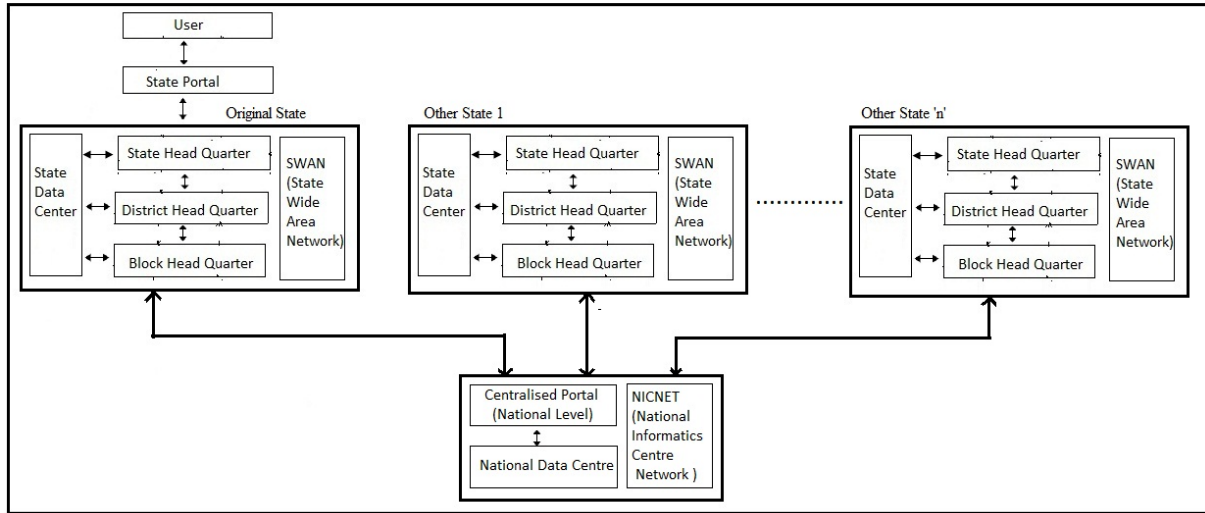


Fig. 3. Proposed Framework for Integration

6.2. Work flow

The flow of work of our model is described in fig 4.

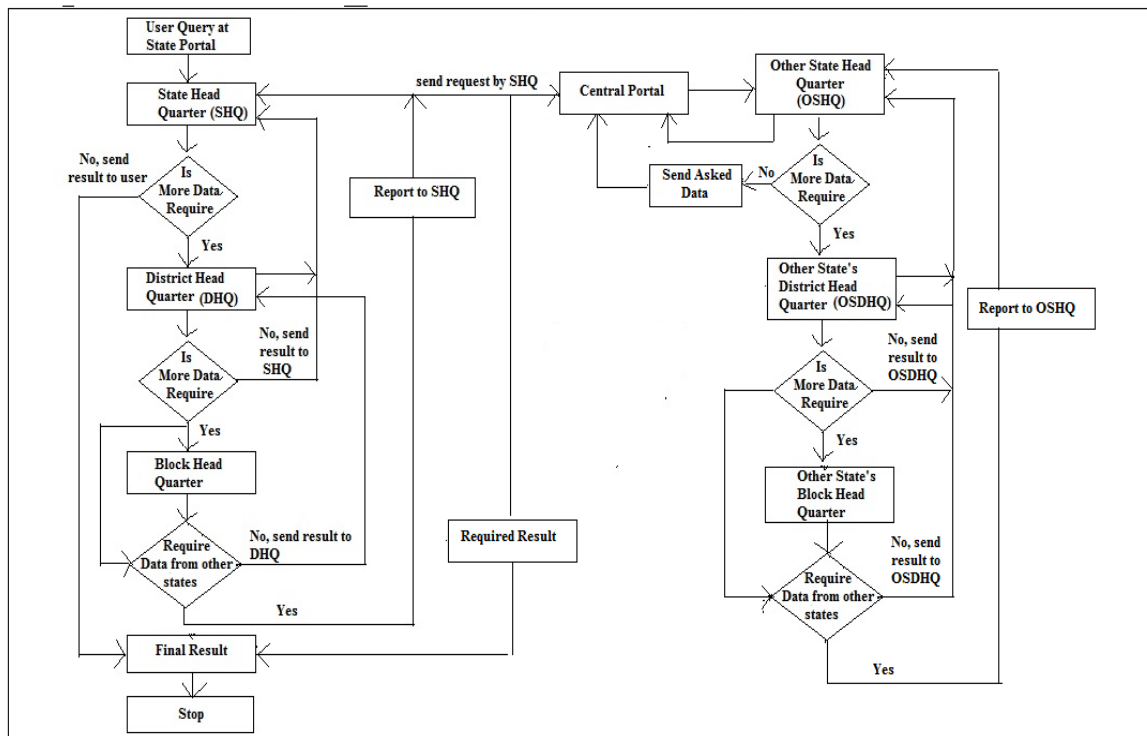


Fig. 4. General workflow of the model

The steps of flow diagram are as follows:

- 1) Step 1: User interacts with the system along with his/her query/grievance through state portal. User will provide all details and lets the portal know if the user has any pending cases requiring attention/assistance of other states data, if so, he/she will select the state and select grievance type, further other details may be provided in a specified online form by selecting the type of grievances and providing details, if any, of the same on the portal itself.
- 2) Step 2: In case a query/grievance requires data/information from the other state, then state code, grievance type and other details will automatically be fetched for further processing it through the centralized portals database.

- 3) Step 3: State head quarter will check the query and other details provided by the citizen/employee and will try to solve it. If for solving the query, State head quarter require any data from district head quarter, the user query will move to District head quarter.
- 4) Step 4: District head quarter will check the query and will try to solve it. If for solving the query, District head quarter require any data from Block head quarter, the user requests is forwarded moves to Block head quarter.
- 5) Step 5: State getting answers of users query the State portal will reply to users.
- 6) Step 6: If for solving the query, a need occurs to get any required information from other States. Simply a request will be sent which will be fetched and processed through Central Portal.
- 7) Step 7: The Central Portal having the details of request in a predesigned format along with the name of state will communicate with the respective state's data center to provide the relevant information related to users' query.
- 8) State 8: The state on getting a request will immediately fetch all related record to provide the require information to the original state through the Central Portal.
- 9) State 9: Finally, the intended user will get desired information/solution to his/her grievances.

The central database records all such communications with states up to a particular time for all future purposes and also for evaluation purpose. It may also maintain a common list of information/grievances which is usually sought by citizens most of the time and the model presumes that various states have digitized all necessary records of its present and past employees and other citizens. Regular updates of such records are also important for flawless functioning of the system.

7. Conclusion

With the evident and planned growth of e-governance across the country, its positive impact is being observed on society. Many citizens centric services can now be accessed like never before. Grievance redressal of the citizens has also been simplified to some extent. State of Uttar Pradesh is also working fast to let its citizens feel that government is at the doorsteps.

Two of its popular projects of U.P. government have been studied and analyzed for their features and issues from the user's point of view. Based on the feedback and suggestions, a generalized framework has been proposed to overcome certain deficiencies. This framework is based on reengineering approach which interconnects other similar project with a centralized database so that citizens of one state having pending issues in other states may also get benefitted by getting information sought or resolving their issues properly.

The framework can be seen as a step towards nationalization of various state specific portals such as SPST and Jansunwai to facilitate one stop solution to every citizen irrespective of their geographical location or domicile.

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