

PROCESS TRANSFORMATION AT DISTRICTS: A CASE STUDY OF E-GOVERNANCE IN INDIA

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ABSTRACT

Under the E-governance Projects several services and procedures of government are being automated to enhance citizen services and experiences. It has been found that if a system is made IT enabled then it renders several activities redundant or one process becomes flexible and efficient at the cost of another, simultaneously it requires reengineering, prioritisation of process and optimisation of resources of the system to garner all benefits. A suitable IT based model is engineered backed up by computerised decision making. One such decision point is taken and decision support is developed through the use of logic available in Operations Research (Travelling Sales Man Problem).

Keywords: *E-governance, Information Technology Reengineering, Decision Support. Process Mapping, Workflow, As-Is Process Map, To-Be Process Map, What if Analysis, IT enabled.*

I. INTRODUCTION

Government across the world are focusing on various ways to provide efficient and transparent services with high flexibility. These services must reach the citizen at affordable cost. Also from 49 empirical studies it was concluded that there were positive e-government impacts on data access, efficiency and productivity of government performance [1] from earlier studies also found that e-government enhances communication between government and citizens [2] Country like India, with high population, the successful model of E-governance is at urge, simultaneously the policy makers must be enough flexible to integrate the various challenges at system level. The innovation is essential for economic development [3]. Standardisation of the processes, providing online services, Database management, open source of the data, by means of this the government expenditure in terms of expenditure can be reduced. Government of India has taken initiatives under National E-governance Plan (NeGP) for the growth of E-governance within the country. The E-governance plan can help to seek the right governance and institutional mechanisms. The Government plan at the Centre, State and local level with integrated service levels to create a citizen-centric as well as business-centric environment for good governance. Under this plan government has vision that all government services accessible to the common man in his locality through a one stop shop (integrated service delivery) ensuring flexibility, efficiency, transparency and reliability at affordable costs to meet the basic needs of the common man” with support of IT.

E-district is a Project under the NeGP. The districts in India are the delivery channels for government administration which caters various services to the citizens such as ration card, certificate issuing, pension etc; therefore e-district can project can significantly improve government service deliveries.

The backbone of above implementation is IT in government processes the benefit of same can helpful to extract the flow of real time information of services which can further help firstly interlinking the functioning of the various departments by increasing the flexibility and efficiency in the system; secondly innovating web enabled applications; thirdly developing management information central data base and lastly utilisation of the computational power.

As the computer capability enhanced with time problems gets solved faster speed. The computers can collect the real time information and can be integrated with mathematical algorithm to solve complex models at very fast speed. In organisations computing power are being used by managers, decision makers, stake holders etc. The solving of large and unstructured problem which are very difficult and time consuming when solved manually for taking decision now can be solved utilising the computing power. This is what precisely known as Decision Support System (DSS). The paper focuses on IT based model for e-district. There are various citizens centric a service delivered at district level, one among is allocation of ration card.

II LITERATURE REVIEW

2.1 E-governance

E-governance has been defined as that which, "seeks to realize processes and structures for harnessing the potentialities of information and communication technologies (ICTs) at various levels of government and the public sector and beyond, for the purpose of enhancing good governance. E-governance puts the citizen at the centre giving citizens the choice of when and where government services. In other terms it gives the flexibility to citizen to accesses the government information and to completion of government transactions anywhere and anytime efficiently and effectively. "Creating an open and transparent government is an ideal index of the effectiveness of gross government activity and progress" [4]. E-government utilizes technology to accomplish reform by fostering flexibility, transparency, accountability, eliminating distance and other divides, and empowering people to participate in the political processes. These services are offered at district level to ensure citizen centric services. In the research paper e-governance is defined as the application of electronic means firstly in interaction between government and citizens and government and businesses and secondly in internal government operations.

E-government can be said to have function of four components namely governance, IT, reengineering and citizen (familiar with computer). The four independent variables require a little elaboration that is e-government without good governance, sound IT infrastructure support, a critical examination of existing administrative procedures followed by appropriate administrative reforms, here designated as reengineering and finally, meeting the needs of citizen, a citizen who seeks public service delivery and interacts with governance online.

The objectives of e-government is to transform government, the same is based on two basic premises: firstly, current government functioning, as exhibited by its public service delivery, is far from satisfactory level. And secondly, government can perform better, with emerging IT. “E-government managers need to be responsible for the quality of service they deliver through the portals and try to understand the need of the citizens” [5]. In this conceptualization, therefore, e-government is transformation of the government functioning. This conceptualization of e-government gives rise to four important corollaries, namely, first e-government is an intermediary stage for transforming government. Thus e-government is not an end in itself but a means for reaching an end. Secondly, e-government must aim at government transformation without which its full potential will not be harnessed. Thirdly, any e-government attempt must be based on administrative reforms, failing which the e-government attempt may not give desired results. And lastly, e-government should strive to reach the ultimate stage, still eluding the developing countries, when e-government becomes synonymous with government.

E-District is a State Mission Mode Project under the National E-governance Plan. The project aims to target high volume services through Common Service Centres. Districts are the primary delivery channels of governance to deliver a large number of services to the citizens; therefore E-governance can significantly improve government service delivery. e-District project covers ten services at Nation and State level. These services are certificates, pension, utilities, dues and recovery, ration card (PDS), electoral services, grievance, revenue court, employment exchange and police department.

2.2 Objectives of e-district Model:

- a. To establish fundamental relationship with citizen;
- b. To integrate and seamlessly deliver citizen services by district administration through backend digitization and reengineering;
- c. Fast processing of public cases/appeals/grievances by IT advantage;
- d. Focus on backend computerization
- e. Infusion of transparency and accountability in operations
- f. Implementation of an efficient electronic workflow system in order to reduce the workload of the district personnel;
- g. To create a smart interface between citizens, governments, public utilities and other information providers;

2.3 Holistic View of Reengineering for e-district model

“Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measure of performance, such as cost quality, services etc (Hammer & Champy, 1993.). Today most of the process used for delivering the services are old age, obstructive, complex and require major rethinking and re-orientation. The reengineering entails dramatic improvement rather than marginal. Reengineering advocates streamlining these processes for today requirements with a scope of continuous improvement [7]. The process of reengineering can deliver radical change in performance, firstly by

reducing redundant and non-value added activities secondly by reducing the number of stages/transfer points of work and thirdly by speeding up the work flow often through the use of IT System.

2.4 Fundamental Attributes of reengineering:

- a. Results in radical change;
- b. Assumes clean slate change;
- c. Focuses on end-to-end processes;
- d. It is top-down directed;
- e. It is information technology enabled.

2.5 Need of Reengineering in the Government Services

The changing environment necessitates government to switch from task orientation to a performance, result orientation and complete revamping so good governance has to be the driving force instead of government. Government has to restructure its structure, processes, rules, regulations and transformation of behavioural attitude of government officials. It has to eliminate redundant hierarchical levels, overheads, obsolete rules and practices and significant reduction in cost and response-time

2.6 Benefits of Applying Reengineering in Government Services

The benefits of reengineering may be simple and one-dimensional, but are more likely to be complex and multi-dimensional; some of the benefits are listed below:

- a. Financial performance gets improved because things get streamlined.
- b. Customer satisfaction improves because he gets services at faster rate.
- c. Cost reduction.
- d. Service quality gets improved.
- e. Delivery performance gets improved.
- f. Productivity increases ideal time reduces.
- g. Flexibility/responsiveness increases.
- h. Process times of services reduce.
- i. Innovation of new ideas those can be applied to other application.
- j. Employee development in terms capability, value, efficiency etc.
- k. Competitiveness among other departments.
- l. Organisational flexibility increases, for example decision can be taken at any level of stake holders, forwarding of application of request has eliminated the middle personal involved in services deliveries.

Government organizations are required to deliver or produce at a low cost, high quality, fast and flexible responsiveness to customer requirements. Therefore, there seems a pressure on organizations to redesign. Out of such pressures was born the idea of reengineering. While reengineering promised radical change the attainment of true reengineering remained elusive for most organizations, with 50-70 per cent of reengineering projects

failing. From above it is felt that there is still a need for process change in holistic and more incremental manner.

2.7 Holistic Approach to Reengineering in e-district model

Traditional approach of reengineering and many literature reviews have emphasized changed based one aspect of an organization for example on with inadequate treatment of human aspect. Reengineering programme can be powerful change approach if it is integrated with verities of change initiatives such as cultural and structural change within an organisation. Therefore, the need for holistic view of change management of government and district administration has to be highlighted as well as incorporated.

2.8 IT Enablement of e-district Services

Role of Information Technology (IT) have reached to long height in various sectors in India. Finance and Insurance sectors are playing a leading role in IT enabled processes. At the same time Government of India had initiated project at district level.

Presently the interacting bodies as shown in figure 1 are:

- a. Users/Applicants;
- b. Process Owner and;
- c. Service Counters

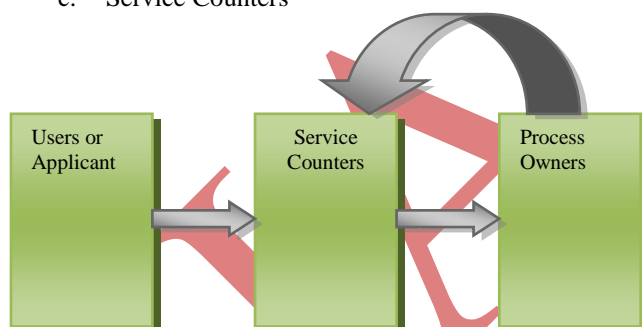


Figure: 1 Traditional Way of Interaction of Bodies

These interacting bodies are responsible for delivery of services and there no role of Information Technology, the service delivery takes lot of time, movement of papers is manual, status tracking is quite difficult, and service levels are not fixed for any work. These deficiencies can be overcome by proposed by Services Architecture shown in figure 2 below in which service counters are being replaced by computer service centres and users can also interact with Web Portal.

2.9 Use of IT and the framework

Incorporation of IT into tradition processes will try to make them more efficient, transparent, aid in compliance, increase visibility, aid in performance measurement, aid in planning etc.

Now the questions are who needs the services? Who will do it? How to avail the services? And how it is possible?

The above figure may be helpful in giving the answers. The interacting bodies are the User, CSCs and the various process owners. They are collectively responsible for forming successful system and delivery to the citizen.

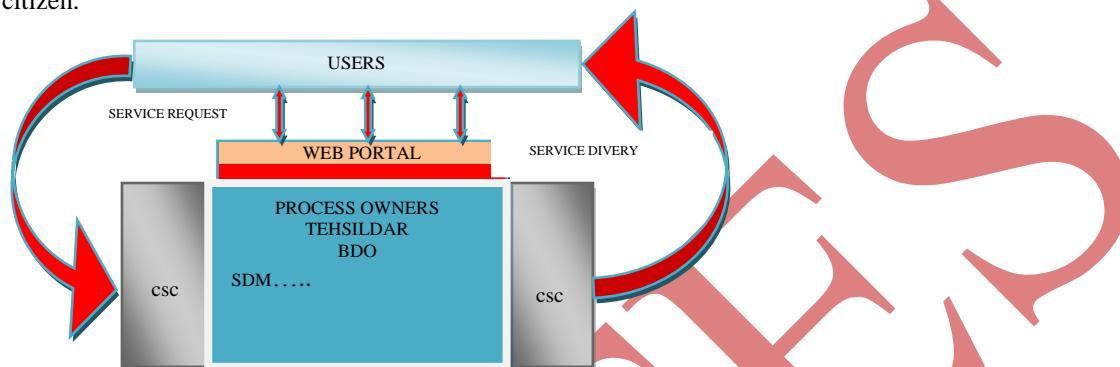


Figure: 2 IT Enabled for Interaction of Bodies

Now again the question arises how these bodies responsible for services are facilitated by the Information Technology for delivery of services?

They are interacting through the various components of IT and the new system is called as e-District system. These components of IT are namely Web Services, Application System, Data warehousing, Notification System and Decision Support System. Details of these components are explained systematically. The requirement of reengineering is necessitated by the integration of the information system. Without discussing the architecture of the information system the entire framework of E-governance will be futile. These components have always remained in the background while performing reengineering and as it is shown in the figure 3.

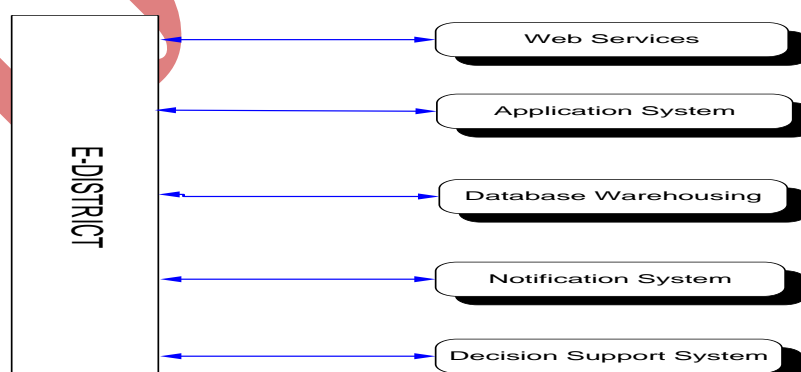


Figure: 3 It Components in e-district

Now the Question is how these IT components are connected with each other and interacting with the interacting bodies. For that we need to understand the IT Architecture. The System architecture shown in above figure 4 can be explained with example of domicile certificate. The applicant/user arrives at CSC for domicile certificate. CSCs are connected through satellite or leased line for accessing the web services. The applicant requests for domicile certificate to CSC operator, operator opens the web portal and enters the particulars, these particulars are stored in temporary database (part of central database) connected to system application. System application generates the receipt number/application number. CSC operator gives the stipulated time for collecting the domicile certificate. CSC operator on applicant request enters the receipt no./application no. and

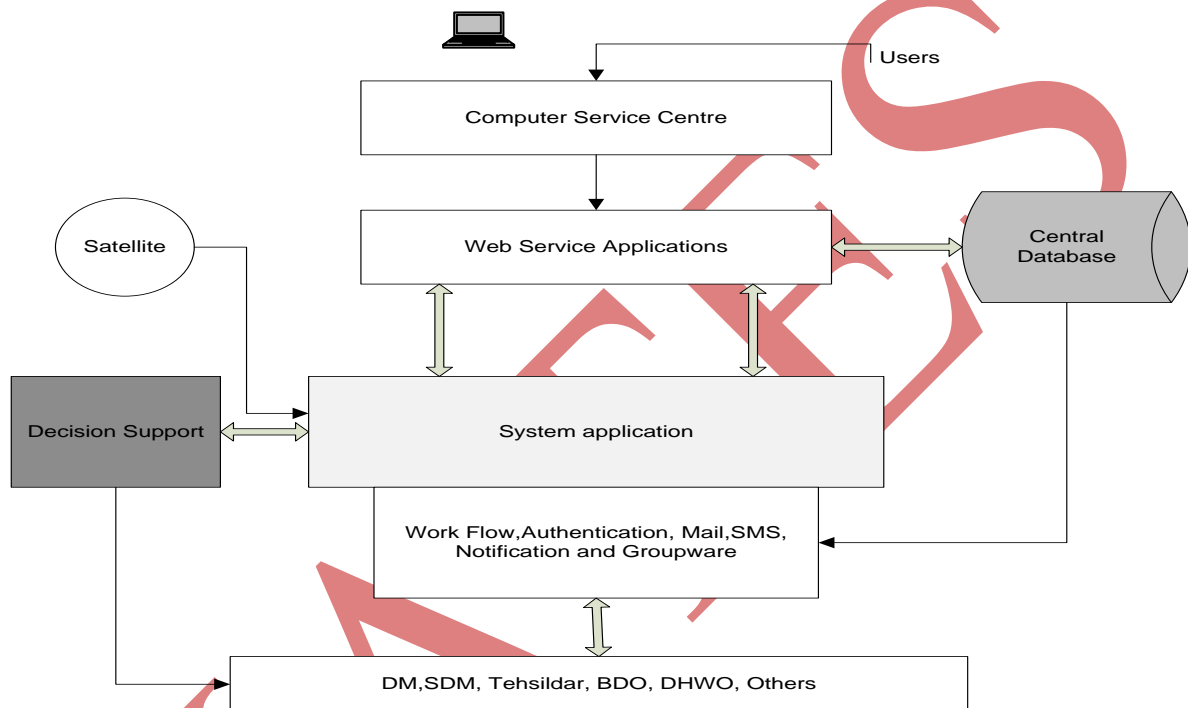


Figure: 4 Overall System Architecture

checks the WIP database if the request is approved takes the print out, stamp it and hand over to applicant, system upgrade the service database

Now the system application notifies to service owner (SDM) connected to LAN. SDM logs in to Personal Database (part of central database) and approves the application if details found and matched either marks for physical verification to Accountant. Accountant does the physical verification and update the Personal database, report sent to SDM. SDM approves the request and update WIP database (part of central database), applicant is send mail or SMS.

Lastly the DSS connected to system application helps to decide the route for various locations in case if there are many applications for verification of different location for Accountant.

2.10 Decision Making for E-Governance

“Decision Support Systems is an integrated, interactive computer system, consisting of analytical tools and information management capabilities, design to aid decision makers in solving relatively large and unstructured problem” [8]. “A number of frameworks or typologies have been proposed for organizing knowledge about Decision Support. In the expanded framework, the two most widely implemented approaches for delivering decision support are called data-driven and model-driven DSS” (Adla, 2007a). “Data-driven DSS help managers organize, retrieve, and analyse large volumes of relevant data using database queries and OLAP techniques” [10]. “Model-driven DSS use formal representations of decision models and provide analytical support using the tools of decision analysis, optimization, stochastic modelling, simulation, statistics, and logic modelling” [9] The three other types of DSS have become more widespread and sophisticated because of Web technologies. Communication- driven DSS rely on electronic communication technologies to link multiple decision makers who might be separated in space or time or to link decision makers with relevant information and tools.

The Web has expanded this technology. “Knowledge driven DSS can suggest or recommend actions to managers”. The Web helps deliver this type of DSS to a much broader audience of decision makers. Finally, document-driven DSS integrate a variety of storage and processing technologies to provide managers document retrieval and analysis. Our primary focus in this paper and discussion is on the first two categories of Decision Support Systems: data driven and model-driven DSS for decision making.

III METHODOLOGY

3.1 Decision Making Opportunities in the e-district Model

There are several opportunities for decision making which has been identified. These are discussed below:

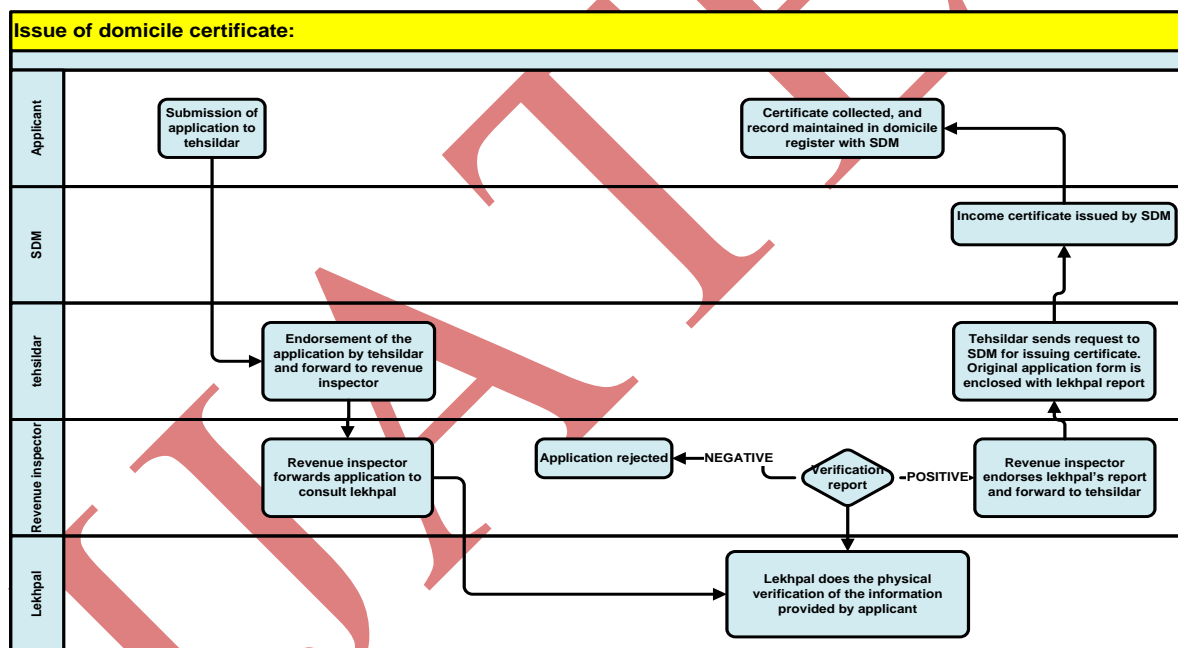
- Decision for Ration Card: Numbers of Ration Card are allocated to several villages after getting the quota for district. This allocation requires frequent changes and updates of number of possible allocations based on the changes done at the central level. This decision may be well facilitated by such decision support.
- Decision for Pension Services: Pension issued to citizen should be equally distributed in the given area. Concentration of pension in one area is should not be allowed. But again such decision is difficult to taken manually. This decision caters to this need.
- Decision for predicting the next year demand of ration card: It is prudent for the district services to inform the centre of next year expected demand rise in the ration card. It better equips the centre to meet the increasing year on year demand and release the quota. Such exercise requires the forecasting techniques and past data and must not be relied on simply hunch of process owners.
- Decision for Routing Accountant: Accountant has the duty of verifying personal details of citizen like name, addresses, age, family members, stay at particular location etc. For this Accountant has to visit the people living in the District physically. This itself is a time taking process and offers several opportunities such as reduction of time, etc.

From above discussed various decision making opportunities routing Accountant has been taken, Accountant does all the work related to field verifications and reports back to higher authorities required deliver the services, for his convenience decision making is described below.

3.2 Decision support for routing accountant

See figure 5, Accountant does physical verification for personal details. The Accountant had to travel various locations for various services. The decision where to go first and complete the verification process in minimum time is the goal. But it becomes physically difficult to decide and this is almost routine work for him. Even the manager (process owner) must know about the status of the verification process in order to maintain the smooth work flow. Services where accountant does the verification are certificate services, pension services, electoral services and other services

The computerised decision support aid the Accountant for determining its shortest possible route. For example the process map of As-Is Certificate Services is as given below:



Process mapping of domicile certificate

Figure: 5 Process Making For Domicile Certificate (As-Is)

Applicant visits the Tehsil office and enquires about the procedure and documents required for enclosing with the request for domicile certificate. Once he completes the all the requirement for certificate and submits in the office of Tehsildar, Tehsildar forwards the application to Revenue Inspector (RI), who assists the work of Tehsildar. Revenue Inspector forwards the application for physical verification to Accountant. Similarly verification for other services would also require Accountant. Accountant does the physical verification and forward the application back to RI, RI endorses verification report sends to the Tehsildar. Tehsildar forwards the

request to SDM for issuing the certificate. Applicant arrives at SDM office and collects the domicile certificate; manual copy of the same is maintained at SDM office. In this process the Accountant faces problem in taking the decision and he decides of his own and takes decision on hunch

3.3 To-Be Model:

Below model is combined model for all types of certificates services. In new model two more new components are involved namely CSC and System Application described in early section. The applicant arrives at CSC and request for the same. The operator at CSC opens the web portal login the details of applicant in the system application which generates the receipt no. at the same time the operator gives the applicant stipulated time. The system application notifies Accountant for physical verification and at the same time to process owner for further processing. The Accountant logs into personal database and looks if physical verification required otherwise marks the application to Tehsildar (Income and Caste) or SDM (Domicile) if Personal Database available.

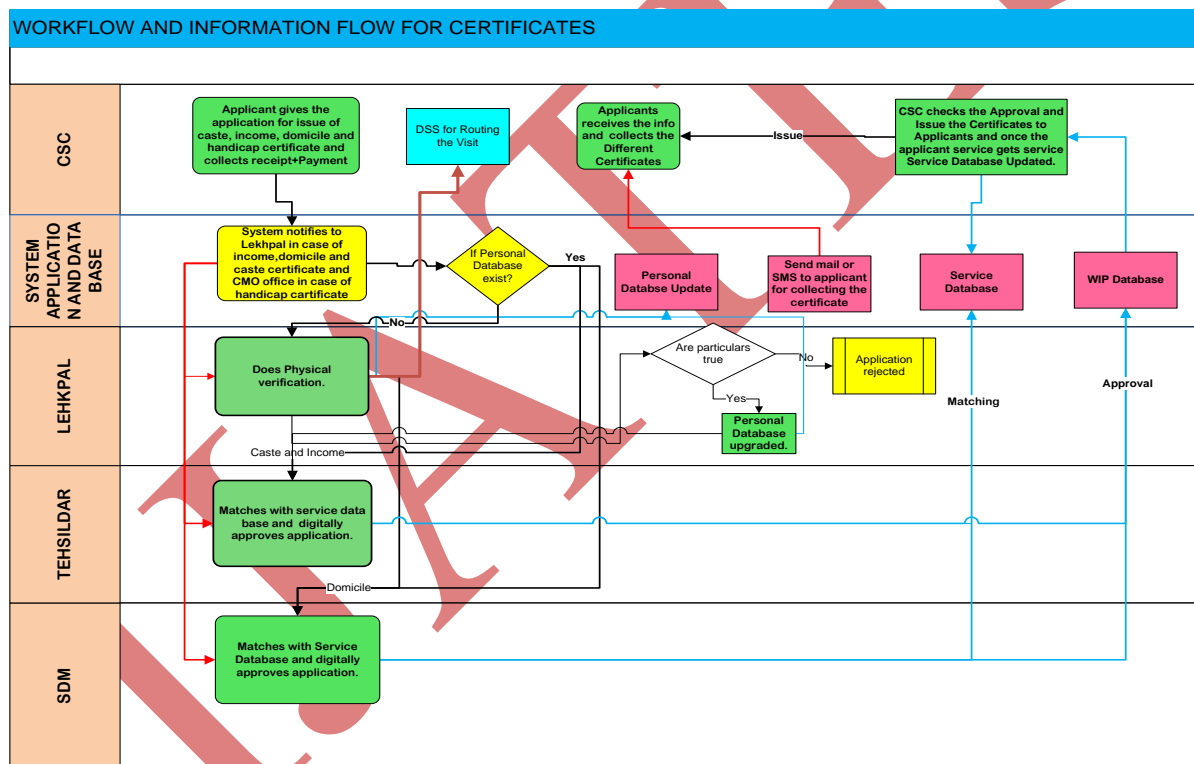


Figure: 6 Process Making for Domicile Certificate (To-Be)

The respective process owner verifies with personal database and digitally approves the application which is stored in WIP database. Once the application stored in WIP database the system notifies the applicant by email or SMS. Applicant visits the CSC with the receipt no. and asks for domicile certificate. The operator logs into WIP database and checks the status of the request if approved by the process owner print the digitally approved application, stamp and sign it to hand over for the applicant, as enumerated in figure 6. In both the processes As-Is and To-Be the Accountant is assigned the work of Physical verification. But the To-Be process designed is IT

enabled, has computing power and Computerised decision making component within the system. The problem faced by him in As-Is process is solved with the help of computerised decision making, such decision making may work on Travelling Sales Problem and the Assignment (Manoj, 2009).

IV CONCLUSIONS

The performance of decision making system can be further improved by considering more decision parameters like taking onto account verification of remaining family members, pending application, dividing the area into more small components, considering the real distance, counting the verification done per day etc.

Likewise more decision support could be developed for an example in case of ration card distribution. The problem faced by the service owner is in allocating the ration cards with even distribution coordinating with the supply and demand of quota allocated in district. The same decision support could work for pension allocation with a little modification.

REFERENCES

- [1] J. N. Danziger and K. V. Andersen, “the Impacts of Information Technology on Public Administration: an Analysis of Empirical Research From the ‘Golden Age’ of Transformation[1],” *Int. J. Public Adm.*, vol. 25, no. 5, pp. 591–627, Apr. 2002.
- [2] Scavo and Shi, *World Wide Website Design and Use in Public Management*. Idea Group Publishing, 1999, pp. 246–66.
- [3] M. Janssen and E. Estevez, “Lean government and platform-based governance—Doing more with less,” *Gov. Inf. Q.*, vol. 30, pp. S1–S8, Jan. 2013.
- [4] M. . Gupta and D. Jana, “E-government evaluation: a framework and case study,” *Gov. Inf. Q.*, vol. 20, no. 4, pp. 365–387, Jan. 2003.
- [5] D. Bhattacharya, U. Gulla, and M. P. Gupta, “Asia Pacific Business Review,” 2011.
- [6] M. Hammer and J. Champy, “Reengineering the Corporation A Manifesto For Business Revolution,” 2000.
- [7] M. Al-mashari, Z. Irani, and M. Zairi, “Holistic Business Process Reengineering: An International Empirical Survey,” vol. 00, no. c, p. 7695, 2001.
- [8] “Book reviews.,” *J. Psychother. Pract. Res.*, vol. 1, no. 4, pp. 387–90, Jan. 1992.
- [9] A. Adla, “A Distributed Architecture for Cooperative Intelligent Decision Support Systems,” vol. 2, no. 2, pp. 22–29, 2007.

- [10] N. Taghezout, A. Adla, and P. Zaraté, “A Multi-agent Framework for Group Decision Support System : Application to a Boiler Combustion Management System (GLZ),” vol. 3, no. 2, pp. 9–20, 2009.
- [11] Singh, M.K. (2009), "Development of Decision Support System for E- District Project of Gaziabhad Through Analysis of BPR", M.Tech Thesis, Indian Institute of Technology, Delhi

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