International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 2 Feb. 2023, pp: 455-461 www.ijaem.net ISSN: 2395-5252

A Smart E-Governance Application Model for Panchayat

Suraj B S, Shrutishree M K
Assistant Professor, Dept of CS&E , PES College of Engineering,Mandya,,Karnataka, India
Research scholar,ATME, Mysore,India

Date of Submission: 03-02-2023 Date of Acceptance: 17-02-2023

ABSTRACT—E-governance plays an important role on all services done on government undertaking projects. It helps the citizens by avoiding corruption and also citizens can know about the status of their application on daily basis. This paper provides application model for reducing paper work in panchayats. The basic aim of our model used in e-governance can be used to provide quick response and delivery of Ration card, birth and death certificates, income certificate as well as caste certificate in panchayats and for this purpose we use digital signature. This encourages citizen's participation in decision making and making government more transparent and effective governance involves new way of communicating with citizens of the state.

Keywords—-e-governance, digitalization, panchayats, cyber crimes

I. INTRODUCTION

The 'e' in "e -governance" is increasingly becoming synonymous with effective, efficient and empowered governance of a country. Currently, the Government of India is in the transition phase and seamlessly unleashing the power of ICT (Information and Communication Technology) in governance [1]. The government is spending an enormous amount of finances in deployment of e-governance Successive surveys have reconfirmed the belief that e-governance projects are making greater impact on the lives of India's rural population compared to their urban counterparts. The rural population of India stands at 833.1 million and the urban population 377.1 million i.e. (% of total population) in India was reported at 68.83 % in 2019, according to census of India, 2019, compiled from officially recognized sources [2].

Panchayat is the lowest tier for rural development. Use of Information Communication Technology (ICT) in e-governance/ e-panchayat is providing fast services to the citizens. In recent year Government has taken many step to improve its online services, like online payment, collection of bills, providing information to its branches through internet and getting their response, online various exam form related to government job, but still we are lagging in rural sector whereas in rural area roads, electricity and water reached out. When we talk about technology used in rural area like computer based services many villages are totally depend on small city nearby that village, not only people of that village depend on that small city but also government officers also depend [3].

The rural population is not getting advantages from modern ICT services. There are many reasons for this gap. It has been seen that this difference in utility of ICT services is because of local language problems, lack of awareness of public services and sometimes availability of proper infrastructure. It has been suggested by several scholars that these problems can be overcome by greater participation of the people in awareness related public functions at panchayat level through dedicated ICT services that makes them aware about the proper use of available resources. Since rural communities are the closest to bottom level problems. Efforts must be made to provide information in local language of the community [4]. Government want their administration to reach out at each person of every village. The state Governments have created several Gram Panchayat institutions to ensure grass root level development, but most of the panchayat are lagging in development because of less use of technology throughout the administrative process [3].

Now a day's people in the rural areas have to go to panchayat office in their location to apply and get their certificates provided in that office. It requires a lot of time and may result in work delay. The data in the office has to be maintained manually. There is no security for the data and faults can be encountered during entering the data mainly which require higher calculations. Various projects are being implemented for improving the service delivery to the citizens through e-governance. But still most of the work in grampanchayat is done on paper; most of the

International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 2 Feb. 2023, pp: 455-461 www.ijaem.net ISSN: 2395-5252

documents issued by Gramsevak are on the paper, delay in that process lead to loss of villager related to his work. Schemes may avail by the bogus people; there is chance of misuse of the scheme fund. Documents and information related to the schemes related to villager may be loss, and then villager will have to again apply for the related document. Which not only increases workload of the Gramsevak, it also create problem for the villager. Also, if villager wants information related to any government schemes contact to gramsevak which is time consuming and there is no assurance that information is correct. Villager doesn't know whether scheme money or any other grampanchayat related money transferred to his account or not. This problem can be solved by using proposed E-governance model.

II. LITERATURE SURVEY

Nityesh Bhatt [10] illustrates that advent of new ICTs has brought a lot of changes and increases economic growth of country. On the other hand, it has created digital gap between the societies. It divides the society into two categories. One category of people is fully aware of ICT and they are using latest technology. Whereas, the second category of peoples are living below poverty line and not fulfill their basic needs. Therefore, the government should consider ICT as well as their basic needs together.

Bhatnagar [11] analyses the status of ICT in rural India. There are some ways to access the ICT like telephony, internet and other electronic media. However, access of ICT is very poor due to larger rural area. Although, the rural population is keen to pay for true value. But, the amounts of money require for providing services of ICT is very high. Hence, in villages services can be provided to the people through NGO cooperatives, private sector and individual entrepreneurs.

Charru Malhotra [12] in her paper stated that since last ten years the government has expend a large amount of money to increase the use of ICT in government offices. ICT is widely used in public and private sectors such as in educational and other centers. On the other hand, the active participation of rural communities in this field is very nominal. So a lot of work is required to be done to improve it. The government makes a lot of effort to provide the ICT services. But the people are facing lot of problems in its use. Because of some hurdles such as lack of local language and need based services, the information becomes useless for the rural population.

Prasad [13] suggested that the success of e-governance in rural area require some key factors like providing decision support to public administrator reforms, increase the citizens participation, improve the service delivery and transparency, organizations increase their services and expand jobs opportunities in rural areas.

Bhavya Shorff [14] observed that Indian government has made policies to design e-governance projects. Accountability in the governance context requires institutionalizing and internalizing the norms of accountability. E-governance is a such tool that manages the affairs and services of public and improve the citizens empowerment. The accountability for public is based with the social agreement of citizens with state. The social accountability can be increased in government and public institutions, when e-governance projects will going to consider the citizens participation in planning and its designing. In the state of Karnataka e-governance Bhoomi project was designed in consideration to social accountability.

III. E-GOVERNANCE IN RURAL AREAS

In rural areas e-governance has its very powerful impact. Here, from agriculture to local information everything is done through e-governance. Below are few of the projects by government for rural areas and panchayats in different fields [5]:

A. Agriculture

There are many E-Governance projects that government has undertaken in rural areas such as:
Agmarknet: It is a project approved by Department of Marketing & Inspection (DMI), Ministry of Agriculture, and Government of India.

Seednet: It is a SEED informatics network under ministry of Agriculture, Government of India. The project was started in Chhattisgarh in the month of July' 2008 for Kharif season.
Mustard Procurement Management System: It is started by Haryana government. It Conducted the Survey of mustard sown by the farmers and feed this data in to the database of the system. This data is then processed and generate coupons having information of dates on which farmer may visit in the mandi to sale his mustard.

B. Vital Information

Common people need certain information for their day to day works such as prices of seeds, fertilizers, loan rates etc. Some popular projects are:
Prajavani: it is started by the Government of Andhra Pradesh.it is a Web based On-line Monitoring of Public Grievances.
E-Samadhan: the Government of Himachal Pradesh stressed upon to develop grievances redressed mechanism so that the genuine public grievances may be redressed in a time bound manner.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 2 Feb. 2023, pp: 455-461 www.ijaem.net ISSN: 2395-5252

C. Disaster Management

To manage disaster, is a very big challenge for the government as these are natural phenomena and are unpredictable. To deal with these disasters, much state government has started e-governance service for this. Project in this area is:

Chetana: It is a Disaster management system which has been started in the state of Bihar to deal with natural disasters such as flood and earthquake.

D. Land Record Management

By facilating e-governance service in this area, millions of land records can be maintain in a very short time span. Major projects in this area are [6]:

Bhoomi: It is initiative of Mysore government to computerize land records. Records of 6.7 million farmers addressing twenty million records in Mysore state are processed. Revenue department of the govt. of Mysore alongside NIC enforced this mechanization of land records. A farmer needs his official land records for several functions like for obtaining loan on crop from any establishment or any legal dispute, etc. issues with the sooner manual systems just like the registers of land record not properly maintained, or not terribly readable result in its mechanization. Any farmer will currently promptly get their land record from land record kiosks out there.

E-choupal: This was established by ITC's Agri business Division in June 2000. It was specifically designed to tackle the challenges posed by unique features of Indian Agriculture characterized by fragmented farms, weak infrastructure and the involvement of intermediaries. It provides farmers with information relating to farming equipment, weather forecasting, crop, etc. [7]. E-choupal contains info concerning the most recent farming techniques, weather forecasts; crop insurance, etc. This initiative of ITC removed the intermediaries who deduct a bigger portion of benefit from the farmers. The farmers may currently directly talk over the costs with ITC for the produce and earn a decent profit. Moreover, the daily mandi value of the varied commodities is additionally obtainable on-line. The productivity of the crops enlarged as currently the farmers may purchase smart seeds and fertilizers that successively yielded profit to the farmers. ITC's e-choupals serve 40,000 villages and four million farmers, creating it the world's largest rural digital infrastructure created by a personal enterprise.

Gyandoot: The project was designed to increase the advantages info technology to individuals in rural areas by directly linking the govt. and villagers through information kiosks. The kiosks give access to a spread of presidency services, like registration of complaints and submission of applications for the issuing of certificates and loans. This has expedited quick access to government services, which the villagers antecedently had to jaunt the district headquarters placed miles away. Nearly 6,000 complaints were filed within the 1st year, light unskillfulness within the workings of assorted departments of the district administration. Such complaints are to be resolved at intervals a stipulated amount of seven days.

E. E-Panchayat

As majority of the population of India lives in villages, the panchayats play a significant role. Government so felt the requirement to boost it and rework it, and then e-panchayat was introduced. If truth be told e-panchayat was known because the Mission Mode Project (MMP). In this 2, 50,000 panchayati raj institutions at the gram panchayat, block and zila parishads were known that were to be joined with ICT. Services provided by e-governance in this area are:

- Issue of Birth/Death certificate.
- Application for inclusion of name in Voter list.
- Conducting various welfare schemes for the poor and needy sections of the society.
- Preparing district wise planning, implementing those plan, and review for success.
- To provide wage employment to the needy from amongst the poorest section of the rural society.
- Rural water supply and sanitation..

Various projects in this area are:

E-GramViswa Gram Project: This Project Initiates e-Gram Project connecting 13716 Gram Panchayats and 6000 Citizen Common Service Centres as a part of the e-Gram connectivity Project by Gujarat.

RajNidhi: "RajNidhi" is a web enabled information kiosk system developed jointly by Rajasthan state's Department of Information Technology and Rajasthan State Agency for Computer Services (Raj Comp).

Raj-SWIFT:-The Rajasthan State's Department of Information Technology (DoIT) has developed Government's own Intranet called as "rajSWIFT"

Support for P&RD sector in Assam: NIC, Assam State Centre has been identified as the technical consultant for e-Governance solution and Computerization of the Department of Panchayat and Rural Development.

SamanyaMahiti by the State Government of Karnataka

IV. PRE-REQUISITES AND CHALLENGES

A. Pre-requisites of E-Governance are:

- **Connectivity**

Connectivity is required to connect the people to the services of the government. There should be a strong connectivity for an effective e-governance.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 2 Feb. 2023, pp: 455-461 www.ijaem.net ISSN: 2395-5252

- **Knowledge**

Here knowledge refers to IT knowledge. Government should employ skill full engineers who can handle the e-governance in an efficient way. These engineers also handle all kind of fault that may occur during the working of e-governance.

- **Data content**

To share any kind of knowledge or information over the internet, there should be its database. This database should have the data content which is related to government services.

- **Capital**

Capital can be on public or private partnership. It refers to money used by government to provide their services or to that sector of the economy based on its operation.

B. **Key Challenges here are:**

- Lack of Integrated Services: There are diverse kinds of services available but all are at different places and it's difficult to manage all at one place.
- Lack of Key Persons: Technical people are quite less in villages and for each center need key people to manage and interact with people.
- Population: India has around 67% rural population and literacy rate is too low. It is very difficult for villagers to have technical knowledge or to make application interaction.
- Different Languages: Due to low literacy we can't expect villagers to speak or communicate in English language. Application should be designed in multiple languages to interact with all state people.
- Privacy & Security: Application data should be secured from attacks as it is very easy to scam village people thus data security and privacy is must.

V. PROPOSED MODEL

All the services which are done manually are made online in the project. The people can get information about their panchayat, activities notifications and all other information related their villages. All the applications and certificates are applied and verified online. Government can announce schemes in the portal itself. The users on the people in the village can complain about their problem through online. Suggestions are also accepted from the people for the development of their village. The user can request any application or document such as birth certificate, death certificate, residential certificates, 7/12 certificates, domicile certificate, receipts for house tax, water tax etc.

A. **Design**

This system has been designed keeping in mind the requirements of an administrator of Grampanchayat records and enables the administrator to make entries in the database about Villager, person detail, tax, certificates. This system also provides him the authority to manipulate his account. We can add much more feature in the system i.e. alert system, message from the Grampanchayat for Gramsabha, we can provide transaction system in which all the money related work handled. It will save time and will reduce corruption. By using this system data collected from different grampanchayat will be helpful for implementing different scheme will help in natural calamities and data can be useful in other field.
Here an application design model is presented for Admin, Gramsevak and Villagers.

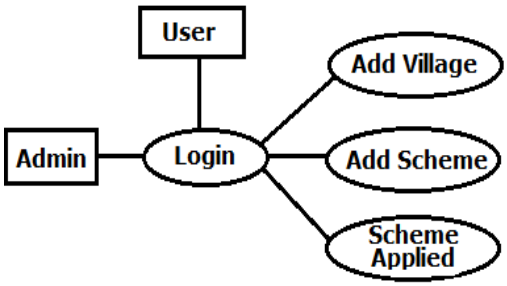

Figure 1: Admin Design

Data flow diagram for admin shows how admin system work, admin have user id after entering into admin window, admin will register the village and information of that particular village gramsevak. Automatically user id and password generated and send to his e-mail id. Admin can see and approve the scheme related amount transfer to villager account. Scheme added and removed by the admin, this scheme information will appear on the gramsevak and villager web page. Request process by the gramsevak appear in the admin window, after studying the document and ground level report by the officer, admin transfer money to the villager as per the scheme fund. Admin can check the account in which villager, name and his account details shown with amount and scheme. Admin can delete or add village as well as gramsevak.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 2 Feb. 2023, pp: 455-461 www.ijaem.net ISSN: 2395-5252

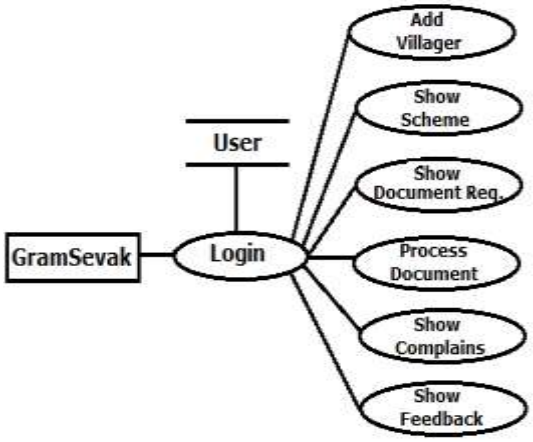

Figure 2: Gramsevak Design

Data flow diagram of the Gramsevak shows that after getting the login detail from admin gramsevak login into the gramsevak window. Where gramsevak add or register villager and villager information i.e. personal details of the villager, like name, birth, date, adhar card no, income, land, electricity, water etc. After adding the villager his generated login detail sends on his email id. Gramsevak can saw details of the scheme and list of the applicant villager. Request send by the villager for the document appear in the gramsevak window, document request process and the process document will uploaded by the gramsevak, at the same time generated secret key send to the villager on his email. By using that villager can access his document. Gramsevak generate reports from the information which gathered from the villager and able save it in the form of pdf file or can print.

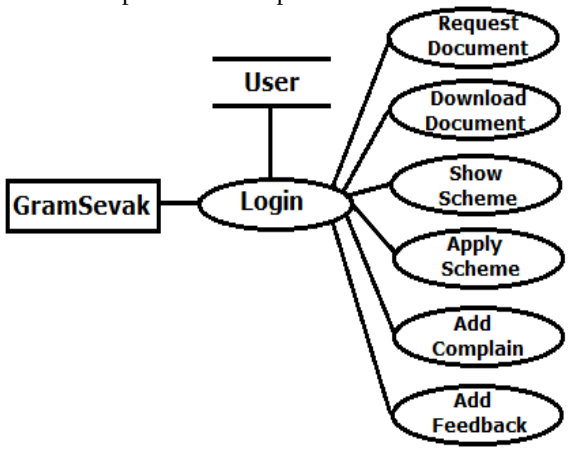

Figure 3: Villager Design

User ID concept is very useful, villager will get its user ID by registering its name and personal data at the Grampanchayat after registering the information user ID and password generated ,it is either send to its e-mail ID. Through that user can register for its requirement through account, if all goes well then user will get copy of the document in its account. Documents like Birth, Death certificate, living certificate, notice of tax collection can be included in the user account. Villager can get his document by using secret key which is send by the system on his email account. Schemes are displayed by the admin in the villager account where villager can apply with necessary document; these documents will be verified. Villager can select different types of certificate. Account information villager account information displayed in villager window, which shows the amount transferred, under the scheme, village name.

B. Cyber Security

We suggest the use of digital signatures to protect our application from hacking and content theft. Some of the algorithms for digital signature certificates that can be implemented are [8]:

- RSA-based signature schemes, such as RSA-PSS
- DSA and its elliptic curve variant ECDSA
- ElGamal signature scheme as the predecessor to DSA, and variants Schnorr signature and Pointcheval–Stern signature algorithm
- Rabin signature algorithm
- Pairing-based schemes such as BLS
- Undeniable signatures
- Aggregate signature - a signature scheme that supports aggregation: Given n signatures on n messages from n users, it is possible to aggregate all these signatures into a single signature whose size is constant in the number of users. This single signature will convince the verifier that the n users did indeed sign the n original messages.

Also general suggestions to shields from other attacks are [8]:

- **Use separate key pairs for signing and encryption**

It is often thought best to use separate key pairs for encrypting and signing. Using the encryption key pair, a person can engage in an encrypted conversation (e.g., regarding a real estate transaction), but the encryption does not legally sign every message he sends. Only when both parties come to an agreement do they sign a contract with their signing keys, and only then are they legally bound by the terms of a specific document. After signing, the document can be sent over the encrypted link. If a signing key is lost or compromised, it can be revoked to mitigate any future transactions. If an encryption key is lost, a backup or key escrow should be utilized to continue viewing encrypted content. Signing keys should never be backed up or escrowed unless the backup destination is securely encrypted

International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 2 Feb. 2023, pp: 455-461 www.ijaem.net ISSN: 2395-5252

- **Real-time protection**

Real-time protection, on-access scanning, background guard, resident shield, autoprotect, and other synonyms refer to the automatic protection provided by most antivirus, anti-spyware, and other anti-malware programs. This monitors computer systems for suspicious activity such as computer viruses, spyware, adware, and other malicious objects in 'real-time', in other words while data loaded into the computer's active memory: when inserting a CD, opening an email, or browsing the web, or when a file already on the computer is opened or executed.

- **Hardware and network firewall**

Network firewalls prevent unknown programs and processes from accessing the system. However, they are not antivirus systems and make no attempt to identify or remove anything. They may protect against infection from outside the protected computer or network, and limit the activity of any malicious software which is present by blocking incoming or outgoing requests on certain TCP/IP ports.

- **Artificial Intelligence and Machine Learning algorithms**

Using latest AI and ML algorithms, further security can be added. These algorithms are used to try to classify the behavior of a file (as either malicious or benign) given a series of file features, that are extracted from the file itself.

- **Steganography**

Steganography is the art of concealing messages into something innocuous in such a way that it is extremely difficult for someone to suspect, let alone find, a hidden message. Steganography masks the sensitive data in any cover media like images, audio, video over the internet [9].

VI. CONCLUSION

Basically e-Governance is the need of the hour so that basic facilities are provided to rural people at the cheapest rate. There are various projects which were already started by government of India like ICT, e-Governance, digital India. The success of these projects demonstrate that there are a number of ways in which e-governance is enhancing productivity in rural India – by enabling solution sharing between local people and communities, providing access to practical and vital information related to farming, markets etc. Panchayats should be provided with adequate technological resources in order to play a meaningful role for the developmental purpose. We provide a solution for an application model that can be included as a part of e-governance. If this solution is successful, then it would provide a one stop solution to problems which has risen to the rural community.

REFERENCES

[1] Kumar, P., Kumar, D. and Kumar, N., 2014. E-governance in India: Definitions, challenges and solutions. arXiv preprint arXiv:1411.1876.

[2] General, R., 2019. Provisional population totals, census of India, 2019. New Dehli: Office of the Registrar General.

[3] A.N.Sangole, S.A.Bhura, "Sustainable development of grampanchayat through e-governance", International journal of pure & applied research in engineering & technology, vol. 2, no. 8. 2014, pp.380-386.

[4] Dhillon, Resham & Laxmi, Vijay. "Reaching Rural Population for E-Governance Through E-Panchayat: A Review Paper", International Journal of Computer Science and Technology. vol. 5, no. 1, 2014.

[5] Yadav, N. and Singh, V.B., "E-governance: past, present and future in India". International Journal of Computer Applications, vol. 53, no. 7, 2012.

[6] Miyan, M., "E-Governance in Higher Education of Indian Rural Areas". International journal of pure & applied management sciences, vol. 1, no. 1. 2018, pp.32-41.

[7] Singh, S. and Rawal, A.P., "Information and Communication Technology in Indian Rural Development Program with E-Governance.," International Journal of Engineering Research & Technology, vol. 3, no. 20. 2018.

[8] Uttarakhand Open University, Haldwani., 2016. "Fundamentals of Information Security",Certificate in e-Governance and Cyber Security Fundamentals of Information Security (PGDCS-01), ISBN: 978-93-84813-88-8, pp 185-194.

[9] Sharma, R., 2012. Study of latest emerging trends on cyber security and its challenges to society. International Journal of Scientific & Engineering Research, 3(6), p.1.

[10] Nitesh, B, (2006),"A critical evaluation of Indian government's strategies to bridge digital divide", THE ANNALs OF" DUNAREA DE JOS"UNIVERSITYOF GALATI FASCICLE I-2006, Economics and Applied Informatics, Year XII.

[11] Bhatnagar, S. (2010),"Enhancing telecom access in rural India: some options India Telecom Conference", Asia-Pacific Research Center, Stanford University, November 2000.

[12] Malhotra, Charu, (2007),"ICT for rural development:An Inclusive Framework for E-

goverenance digital democracy in India", International conference on e-governance, Hyderabad, 28-30 Dec 2007. Proceedings in book form Adopting e-governance (Ed.G.P.Sahu) pp. 216-226. [Online] Available: http:www:iceg.net/2007/books/3/26-380-3.pdf

[13] Prasad, K,"E-Governance Policy For Modernizing Government Through Digital Democracy", In India' Publishing, JOURNAL OF INFORMATION POLICY 2 (2012), pp. 183-203, 2012.

[14] Bhaya P. Shorff (2012),"Design of e-governance projects for accountability: The Indian context", CP Refrica 2012/ CPR South 7 Conference on Sep 5-7,2012, Port Lousis Mauritius. [Online] Available: SSRN: http://ssrn.com/ abstract=2146403.