

E-governance: An Approach to advancing Rural Development through IT Sector

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Abstract—Among the emerging Asian economies, India is a nation with 70% of the population living in rural areas, which puts pressure on the government to focus more on the development of rural India. Information and communication technologies or ICTs act as providers of great opportunities for rural livelihoods and contribute to poverty reduction. The productivity of rural areas can be improved through the use of ICT and through various electronic governance initiatives such as E-Choupal, Akashganga, Gyandoot, Tata Kissan Kendra, Kissan Call Center, etc. in electronic form. Through this, the government can guarantee greater transparency and better administration. In this research paper, it is tried to identify different basic components that have led to rural development through various ICT initiatives.

Keywords: e-governance, ICT, rural development, India; rural e-government projects; developing countries, IT sector

I. INTRODUCTION

Good governance is an efficient and effective management of the country's resources and problems in an open, responsible, fair and responsive to people's needs. Good governance minimizes corruption, the opinions of minorities are taken into account, the voices of the most vulnerable in society are heard in the decision-making process and respond to the present and future needs of society. Electronic government (e-government) is an essential part of good governance.

E-government is an important facilitator of good governance. E-government is the use of information and communication technologies (ICT) to transform the government by making it more accessible, effective and responsible. ICTs allow better interaction between the government, its institutions and people. Therefore, ICT can improve

- **Democratic governance:** better representation of citizens in state institutions, allowing transparent elections and the participation of society in general in national democratic discourses.
- **Economic governance:** cleaning up the general macroeconomic framework of the country, including the banking and financial sectors.
- **Administrative governance:** bringing citizens closer to administration, civil register, land management, population census, tax collection, etc.

India is a land of villages and millions of aspirations and hopes reside in its rural segments. It has 36% of the world's poor earned less than \$ 1 a day, with 300 million illiterate people and 260 million below the poverty line (GLP). Agriculture is the main occupation of about 70% of Indians.

A large part of the rural population is isolated in terms of access to information, materials and markets. Tele-density (the number of telephone lines per 100 people) is less than 1.7% in rural areas, while it is more than 20% in urban areas. Therefore, rural areas are relatively disconnected from the national mainstream.

According to a study by the Indian Data Corporation (IDC) Index of the Information Society (ISI), 2004, India deploys 51 of the 53 nations in calculating the capacity of each country to access and use information and wealth. The survey covers four categories of infrastructure, namely the Internet, computers, telecommunications and social factors. The general position of India in 51 shows a ranking of 43 in the Internet category, 51 in computers, 53 in telecommunications and 51 in social factors. These classifications indicate that there is a much smaller capacity to access and use information and IT than other countries.

The digital divide does not derive from technology, but is due to an unequal distribution of technology. It is a reflection of the lack of basic literacy, poverty, health and other social issues. ICT can eliminate barriers to information asymmetries that impede the functioning of markets that are critical to economic growth. However, the Indian government is committed to developing rural segments, in various ways, including infrastructure and the promotion of e-government initiatives.

II. RELATED WORKS

A. Rural Development and Governance

In the rural context, development involves the use of physical, financial and human resources for economic growth and

social development of rural economies. The term rural development also represents an improvement in the quality of life of the rural population in the villages. According to Chambers [1] "Rural development is a strategy that allows a specific group of people, poor women and men in rural areas, to get more for themselves and their children than they want and need." [2] Defines rural development as "a process that leads to a sustainable improvement in the quality of life of the rural population, especially the poor". The fact is that three quarters of the world's poor, about 900 million people are in rural areas, and Millennium target of poverty is by far the Millennium Development Goals (MDGs), cannot be met without the world talk about rural poverty. "Sustainable rural development can make a contribution to four critical goals: poverty reduction, national and global growth of broader sharing, internal security, food and sustainable management of natural resources" [3]. Therefore, there is a growing emphasis on the development of the rural economy of the countries around the world. Any improvement in the social and economic status of rural areas not only directly benefits rural poor people, but also reduces migratory pressures in cities and contributes to a positive effect on overall progress towards development.

B. ICT & Governance

ICTs are an integral part of development strategies in developing and developed countries. It has great potential to incorporate the desired social transformations by improving access to people, services, information and other technologies [4]. ICT applications can improve opportunities for the poor by improving their access to markets, health and education. Furthermore, ICT can empower the poor by expanding the use of government services and reducing risks by expanding access to microfinance [5]. The uses of ICT for development are actively promoted for economic development, job creation, rural development and poverty reduction. By adopting ICT in the mid-1990s, the public sector underwent a major transformation. The application of ICT in governance processes can be considered in two categories, that is to say. improve government processes and, secondly, encourage interaction with and within civil society. Examples of the previous category are the dissemination of mechanisms for the repair of requests for public information, payments for public services and billing services [6]. This public-sector ICT intervention, managed by the government, is known as an electronic government. Secondly, ICT enhances the participation of civil society in the governance process, also known as e-governance. E-government has a greater scope and connotation than e-government, although terms are normally used interchangeably [7].

C. E-Governance for Rural Development

Rural e-governance can provide timely information to citizens and has the potential to generate innovative means of generating wealth in the rural context [8]. ICT can improve living standards in remote and rural areas by providing

important commercial, social and educational benefits. Electronic service centers have a fundamental role to play, especially to reach marginalized sections living in remote areas. A study by [9] concludes that in a developing economy such as India, ICTs have applications for development in the areas of education, governance, environmental monitoring, health, the promotion of human rights, of economic growth and other areas. Previous research confirms that transaction costs have been substantially reduced by adopting automated supply chain management models for the sale of agricultural products [10]. Other studies show that e-government projects are successful in rural areas of India as intermediaries between government and beneficiaries, pursuing commercially viable objectives [11].

D. Alternative approaches

Social processes in rural regions must be holistically integrated with the prevailing governance model to ensure development [13]. The creation of links with local strengths and the promotion of the indigenous development of e-governance initiatives [12] would positively contribute to the achievement of a country's development goals. Instead of importing or imitating existing e-government models, the interfaces of ICT interventions employed in rural areas must be customized and localized content to provide the expected benefits to rural beneficiaries. [14], conclude that there is an urgent need to recognize the role of local knowledge in sustainable development. They also argue that interactions between local agencies and the development worker must be improved to ensure the success of the development process. Given that communities are closest to basic problems, they are the best judges to evaluate technological alternatives and provide innovative solutions to problems in their respective areas. This perspective of "from the inside out" and "from bottom to top" to technology has been supported by various socialists [15]. This form of government has always been preferred and is known as the "government of the community".

Therefore, in a rapidly changing global environment, governance must also develop competitiveness through innovative response mechanisms. This requires a conscientious balance between global demands and local priorities, as well as a balance between the needs of the various stakeholders that are integrated into the governance processes. By adopting a holistic approach in the design of ICT interventions for governance, using systems theory, these conflicting priorities and different needs can be easily solved.

III. E-GOVERNANCE

Since India has adopted e-government as part of its policy, e-government has witnessed a productive turnaround. Electronic governance uses information communication

technologies to improve interactions within government departments and between citizens and government [16]. Prabhu states that the motto behind E-Governance is to provide a SMART government (simple, moral, Accountable, Responsible and Transparent) [17].

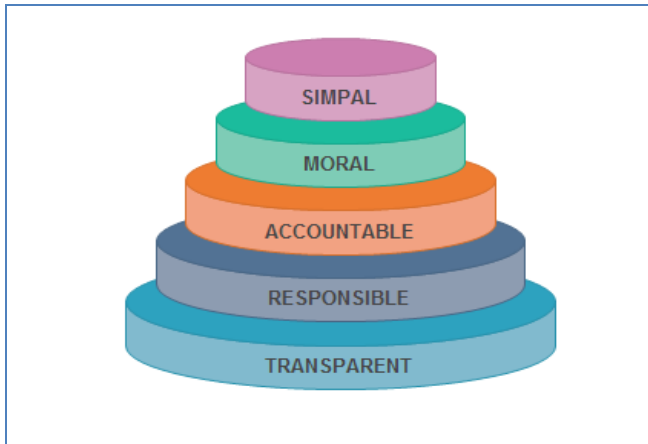


Figure 1: Motto behind E-governance [source: E-governance Concepts and case studies, [17]]

Abramson and Means define electronic government as an electronic interaction (transaction and exchange of information) between government, public (citizens and businesses) and employees [18]. The World Bank has defined e-government as the use of information technology by various departments and government agencies that have the ability to change the relationships between people, businesses and government. These technological advances are able to provide numerous benefits, such as the sudden provision of services to citizens and businesses, better accountability of citizens, reduced levels of corruption and efficiency in the working styles adopted by the government [19]. The concept of E-Governance is not only used in India, but is also recognized around the world, especially in China, where a large number of open source products are available [20]. Electronic governance initiatives have not only benefited people by providing market information economically, but have also contributed to increasing the level of education of students living in rural areas through various educational projects. Surely, these projects are a necessity of the hour and there is ample room for the introduction of such projects in the development of rural areas [21].

A. Background and Global Era of E-governance

On the one hand, e-government initiatives have prospered well in many parts of the world, while, on the other hand, bankruptcy stories abundantly reflect that such initiatives with development prospects have not produced encouraging results. Estimates indicate that 35% are total bankruptcies, 50% partial failures and 15% are successful in developing and transition countries [22]. These failures are due to a gap between the design phase of a project and the final phase of

implementation. Significant differences have been observed in the way projects are implemented. Despite unpromising results, e-government initiatives in developing countries have reached a level of recognition among government agencies.

Electronic governance projects have reached the level of maturity in many countries and in many countries the level of maturity has evolved. However, using these services has been a challenge. Wilson says that in a developing economy like India, ICTs have progressive applications in health, education, governance, environmental monitoring, human rights promotion, economic growth and other areas [23]. A survey conducted by Annamalai and Rao showed that there was a substantial reduction in transaction costs after the adoption of automated supply chain management models for the sale of agricultural products [24].

B. The Concept of E-Governance

The main The term e-governance focuses on the use of new ICT by governments, as it applies to all government functions. Therefore, electronic administration is the application of information and communication technologies for the provision of government services, the exchange of information, communications, transactions, integration, various independent systems and services between the government and citizens, government and enterprises as well as administrative and administrative processes. Interactions within the whole framework of government work. Given that the government is the service provider, it is important to motivate employees to provide services through ICT. Electronic governance aims to achieve efficiency, transparency and citizen participation. Strengthening electronic governance through ICT contributes to good governance, trust and accountability, citizens' awareness and emancipation, citizens' well-being, democracy and the nation's economic growth. ICT is the biggest facilitator of change and process reforms vanish before what ICTs have achieved in a few years.

However, e-government services through ICT relate to transactional services involving local, state or national governments. ICTs act by accelerating the flow of information and knowledge between government and citizens and transforming the way governments and citizens interact. According to the United Nations Development Program (UNDP), the challenge for all countries is to create and develop a system of government that promotes human support and development. Governments in many parts of the world have invested heavily in ICT to improve governance processes.

In India, e-Governance applications in the recent past have shown their positive impact on minimizing processing costs, increasing transparency and supporting economic development through income generation initiatives, increasing agricultural production and improvements in

health sectors, and education, all factors that promote the quality of life in general of the rural population. ICTs contribute to providing transactional services to the rural population with time and cost savings in obtaining efficient and effective public services, and also analyzing changes in agricultural productivity and improving the quality of life through ICT services. In addition to the previous AEPS, GPS, etc., it is fundamental in ICT services. Rural ICT applications attempt to offer the services of central agencies (such as district administration, cooperative union and state and central government offices) to citizens on the steps of their village gate. These applications use ICT to offer improved and cost-effective computing and connectivity solutions.

Poverty can be adequately addressed through the effective use of electronic governance and the application of ICT in environmental management. Better governance through the use of ICT can have a direct impact on reducing poverty and improving the environment. ICT can do a lot to make government processes more efficient and transparent, by encouraging communication and the exchange of information between rural and marginalized populations. Farming communities and organizations can receive help through the use of ICT to strengthen their skills and better represent their constituents when they negotiate input and product prices, territorial claims, resource rights and infrastructure projects. ICTs enable rural communities to interact with other stakeholders, thus reducing social isolation. Extend the perspective of local communities in terms of national or global developments, open up new business opportunities and allow easier contact with friends and family.

C. Challenges in E-governance

The main obstacles encountered in making work public services for citizens are (a) lack of accountability, (b) lack of transparency and (c) lack of commitment [Bestle 2005]. In many cases, public services do not reach the poor in rural and remote areas, and even when provided (such as health care), the lack of quality to impact poverty reduction. An important public service challenge is the lack of a direct mechanism for responsible citizens for service providers. The 'path' of responsibility is too long and poor citizens rarely able to communicate with policy makers with information, complaints, suggestions, etc. Even if citizens could reach politicians, the problem is equally difficult it is possible that this interval does not necessarily entail better service because policy makers formulation can not necessarily guarantee that the public service provider (be they public, private or NGO) provide quality services because of a similar "path of responsibility" between the policy maker and the provider of services.

As illustrated in Fig. 1, ICT-based e-government systems can play a pivotal role for the poor blaming policy makers and service providers sustained service delivery according to the

policy implemented for poverty reduction. Therefore, e-governance systems could provide a mechanism to provide services that are more favorable to the poor, if the government can succeed in strengthening ties and making the "path of responsibility" between policy makers, service providers and the poor of the countryside shorter using e-Government for planning and monitoring policies, policy implementation and provision of services related policies.

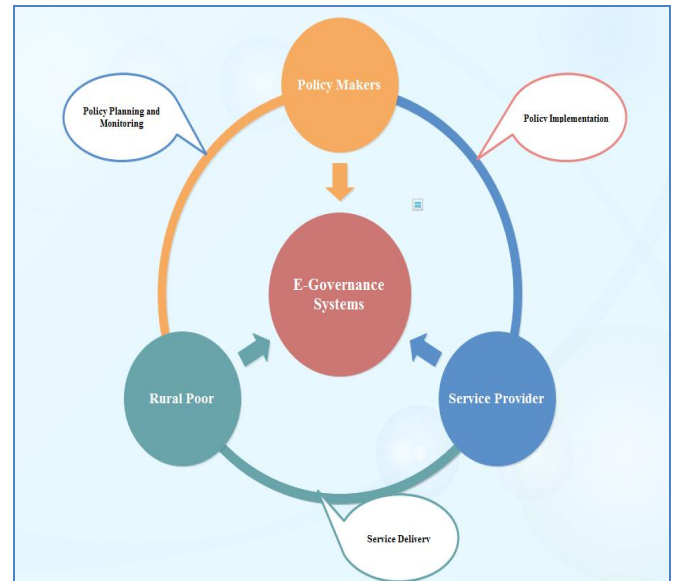


Figure2: E-governance for Policy Planning and Control

Strangely, the main focus in e-government projects has been exclusively on service delivery and the role of e-government in policy planning, implementation and monitoring has been largely neglected. The role and design of such policy planning support systems (PPSS) and policy implementation support systems (PISS) have been outlined.

D. Conceptualizing E-governance

At To understand electronic governance not only as an application of ICT in government, we must understand it conceptually. That is, we must ask ourselves the question "why electronic governance was born in the first place and how it should be considered if it should mean something more than ICT in government work". To achieve this, we place e-government within the broad joint evolution of ICT in general, on the one hand, and government institutions, on the other.

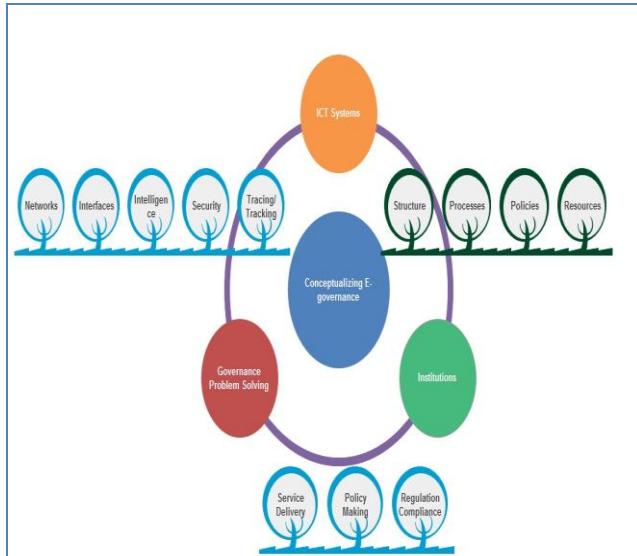


Figure 3: Conceptualizing E-governance

This broader picture of the co-evolution between ICT and governmental institutions refers, in fact, to all sectors of society, such as health, education, funding, etc. Furthermore, electronic governance must be included in the broader transformation of this policy that is, the broader transformation of the way in which collective problems have been resolved over time with respect to three functions: provision of services, formulation of policies and compliance with regulations (Figure 2).

E. Importance of E-Governance

The process of electronic government has already started. The Indian government has decided to open a lakh of common service centers across the country under the National Government Plan (NeGP) so that all government services are accessible to the common man in their locality and ensure efficiency, transparency and reliability of such services at affordable costs to meet the primary needs of the common man. Now, the Indian government has initiated the process to equip all Gram Panchayat with computers or provide access to computers with broadband connectivity. All Panchayats at all levels must be equipped with hardware and connectivity for the next few years. The approach would consist in the first use of the kiosks that are configured on the initiative of the NeGP common service centers. For the remaining Panchayats, it is proposed to hire independent service providers that would be selected on the basis of a bidding process. It was also planned to equip all the panchayats of the software and the skills necessary to manage e-government for a better provision of services to citizens.

Subsequently, governments at central and state level have the vision and strategies to reduce the digital divide and provide support infrastructures in rural areas to improve the ability of panchayats. Under the Bharat Niram program, the Indian

government emphasized connectivity and other basic facilities. The Ministry of Energy has introduced a scheme that aims to provide electricity in all villages and homes within four years, and thus provide access to electricity to all rural households (Ministry of Energy, Government of India, Bharat Nirman -Electrificación). It has been proposed to reach a rural teledensity of 25% through 200 million rural connections by the end of the eleventh five-year plan. The eleventh five-year plan also aims to provide broadband connectivity to all secondary and high schools, to all public health centers and to Gram Panchayats.

IV. E-GOVERNANCE IN RURAL DEVELOPMENT

A. COMPUTERIZED RURAL INFORMATION SYSTEM PROJECT [CRISP]

The CRISP aimed to help the District Rural Development Agency [DRDA] observe the exercise of poverty reduction programs through the information system. So far, four versions of software packages for CRISP applications have been developed. Rural Soft was the fourth version. Rural information efforts have marked the beginning of electronic governance in India. One of those initial efforts was Rural Soft 2000. Through Rural Soft 2000 the common man can access all the information in the government portals and also allowed the government to monitor the functioning of different agencies. The latest in the series is Rural Soft, a scalable solution that helps in the web-based monitoring of poverty reduction schemes. It was implemented in 15 districts of the country, which were connected via the VSAT (satellite-based) network of the state of the art from the ministry.

B. NEGP & NIC

For the success of e-governance, Government launched National e-governance plan and with the help of National Informatics Centre set up a central repository for all e-governance initiatives.

- **NeGP:** The national plan for e-government was launched with the following vision: "Making all public services accessible to the common man in their locality, through outlets of common services and ensuring efficiency, transparency and reliability of these services [17] NeGP emerged on May 18, 2006, by the Department of Electronics and Information Technology (DEIT) and the Department of Administrative Reforms and Public Complaints (DAR) PG) NeGP was configured with 27 projects in Mission mode (MMP) and 8 components It is designed specifically for rural areas and for easy access to services provided by the extensive NeGP state network (SWAN) established the Common Service Center (CSC).
- **NIC:** NIC is part of the Department of Information Electronics and Technology of the Ministry of Communications and Information of India and emerged in 1976. It is a website designed for all e-government

initiatives taken by the government in one place. This includes blocks, districts, state government and central government. The NIC ICT network is called NICNET.

C. E-GOVERNANCE PROJECTS IN RURAL INDIA

(i) **E-CHOUPAL:** India has seen massive industrialization in the last decade, but agriculture is still a dominant occupation in India. Farmers are often exploited by unreasonable intermediaries at every stage of the process of selling their products to the final consumer. These brokers or agents add their profit margin and try to hinder market information. To solve these problems, the International Business Division of the Indian Tobacco Company (ITC-IBD) has launched a step called e-Choupal (which means a village meeting place). As part of this initiative, several e-Choupals were created in about 6500 villages in 2012 and each e-Choupal was equipped with a PC, Internet connection, printer and uninterrupted power supplies (UPS). Thanks to this, ITC-IBD managers could obtain cheaper raw materials directly from farmers, and farmers could also benefit from this because there are no intermediaries involved. Indian Tobacco Company Ltd. has added 7 new E Chupali a day and plans to expand up to 20,000 E-Choupals covering 100,000 villages in 15 states, serving 15 million farmers by 2020 [18].

(ii) **GYANDOOT:** Public officials have consulted several Gram Panchayats in the Dhar district of Madhya Pradesh. The project started in January 2000 and was called Gyandoot. Gyandoot is very advantageous since it is cheap and is owned by the rural intranet system that is Soochnalaya, as it helps to meet the needs of the villagers in the district. Rural youth manage 35 centers of this type that have been established since January 2000. Educated young unemployed have been trained, have managed Soochnalaya and are known as Soochaks. They provide various types of services related to agriculture, education, health, women's issues, market information and user fees charged to all of this. In addition, they serve to make the request for services provided by the district headquarters for land ownership. Soochnalaya is connected to telephone lines over the Internet. More than 600 villages and about 50% of the total population of a district are covered by the network of 31 kiosks of this type [19].

(iii) **JAGRITI E-SEWA:** In the developing nation like India, Jagriti E-Sewa is an appropriate, applicable, reasonable, accessible and sustainable technology. Sometimes old computers are used. This project is used with the help of remote access telephone lines. A minimum period of time is required to change the whole system in any language. These kiosks are located in the central point of the city or in the most famous places of the city, so that a kiosk can serve as a minimum of 25,000 to 30,000 inhabitants. Each kiosk is franchised, where the franchisee is a young educated or former military. The franchisee must generate sufficient income to cover the cost [20].

(iv) **AKASHGANGA:** Akashganga uses ICT to help milk producers in rural areas by creating cooperative societies and by obtaining milk and helping to keep accounts. In Gujar, the first kiosk (DISK) model of dairy information systems was implemented in the Uttarsanda Dairy Cooperative Society. In this society, every farmer has an individual identity card (plastic card). Your identification is updated on a PC when farmers arrive at the raw milk receiving basin (RMRD). While the milk is emptied into the steel drum, the weight of the milk can be measured and, at the same time, recorded in the PC. However, an operator is required to fill the cans and a separator operator to measure the fat content. The new technological development includes scale, microprocessor, printer, milk analyzers and a screen to perform these operations [21].

(v) **KISSAN CALL CENTRES:** There is a change in the language after every 50 km in India. These call centers are specially designed to continuously respond to the questions asked by farmers in the vernacular. This plan was launched in April 2002 by the Ministry of Agriculture and Cooperation, Ministry of Agriculture. The plan was launched to provide the inhabitants of agricultural villages with telecommunications infrastructure. Since most villagers are unaware of the latest technological developments in the country, these centers are specially designed to serve to raise awareness among farmers. Free numbers are provided to farmers, as the services must be free for all those who need it. Thus the Department of Agriculture and Line Departments, the SAU and ICAR organizations are mandated by the Ministry of Agriculture to publicize free KCC numbers. Advertising material includes posters, graphs, training and demonstration programs, etc. [22].

(vi) **TATA KISAN KENDRA (TKK):** In Uttar Pradesh, Haryana and Punjab, TATA Chemical Limited launched Tata Kisan Kendra (TKK). Geographical information systems (GIS) help the TKK to trace the basic areas related to agriculture such as soil, groundwater and climate. The new software called GIS reports on roads, buildings and rivers. Data is the form of digital maps and provides information on the socio-economic, administrative and physical configuration. With the help of the satellite, the images are processed, which helps to detect insect attacks throughout the state and to obtain crop estimates. Satellite helps even more in updating maps and detecting unproductive agriculture. Approximately 800 affiliates and 40 other kiosks will serve 48,000 villages [23].

(vii) **Drishtee:** Drishtee has removed the barrier to provide limited services due to poor infrastructure by installing its Wi-Fi system in the Sirsa district (Haryana) as an experimental launch with the help of social funds. Drishtee has also removed the obstacle for poor farmers, collaborating with some microfinance institutions and funding them so they can create their own kiosks.

(viii) **RASI:** To eliminate the obstacle of non-standardized processes, RASI has defined a standard process and implemented it in all districts. A simple check was carried out to know the differences in the processes. RASI has connected all its systems on the LAN and has provided access to land records.

(ix) **N-Logue:** The TeNet group tackled the problems of delayed testing and expensive technology, and the group eliminated them by installing technology in many countries outside India to gain acceptance in India. To accelerate implementation in rural areas, the TeNet group has started providing telephone services that implement their technologies.

(x) **Lok-Mitra:** Since connectivity in remote areas would remain a problem, the NIC has switched to the Internet. With the transition to the Internet, the LokMitra scheme is not limited to Hamirpur and people across the state receive a redress of their complaints.

Gyandoot	Power breakdown interrupts working and networks get disconnected	High operation costs due to multiple services rendered	Difficulty in getting technically skilled youth in remote areas
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D. Progression of rural e-government projects

The following is a description of the design and implementation dimensions. The design dimension includes three phases:

(i) **Introduction:** This phase emphasizes informing citizens by providing a single point of access to government information through single agency web portals. The services provided by the individual agencies are limited to people living in the areas where the kiosks are located, as they are not connected.

(ii) **Infusion:** Characterized by adopting the principles of electronic governance (citizen-centered, accessibility, accountability and transparency) and installing online payment applications. The information kiosks are all connected and therefore offer similar services to citizens.

(iii) **Personalization:** Citizens have electronically maintained the personal profiles of their financial transactions with the government. The emphasis is on maximizing the value of e-government for citizens, for whom the service delivery process has been redesigned and customer relationship management techniques have been implemented. Moreover, it makes it easier for users to buy / sell online.

The implementation dimension includes three phases:

(i) **Publishation:** this phase consists in the online publication of government information. These sites offer a wide range of services with support in the local language. The emphasis of these sites is on the dissemination of information.

(ii) **Interacting:** at this stage, communication flows from citizens to the government and vice versa. These sites provide comment modules, e-mail services or public meetings where people can share their ideas.

(iii) **Transact:** this phase offers online e-commerce services in addition to other services. This phase is quite useful for entrepreneurs, farmers, the unemployed, students, etc., to carry out their transactions.

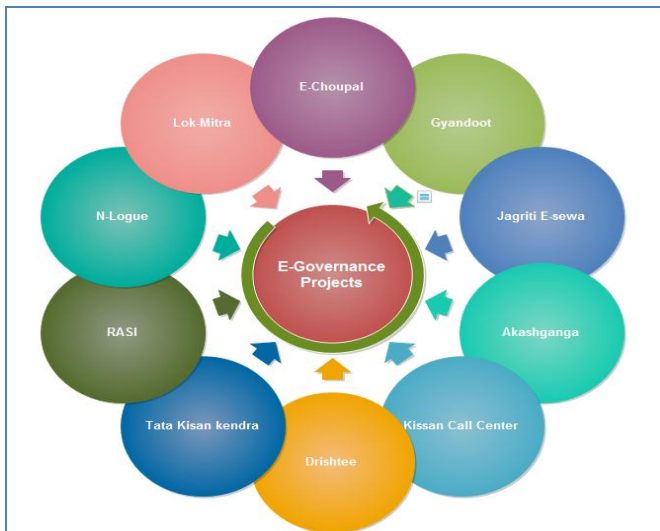


Figure 4: E-governance Projects

Table 1: Bottlenecks in E-Choupal and Gyandoot Projects [source: E-government Milestones in India [19]]

Project	Operational Bottleneck	Economic Bottleneck	Personnel Bottleneck
E-Choupal	Infrastructure provided to ‘Sanchalak’ was outdated	Lack of financial resources to procure infrastructure	Challenges with regard to provision of technical education to fresher’s in rural areas

Table 2: E-government Implementation Framework

Design Dimension	Implementation Dimension		
	Publish	Interact	Transact
Initiation			
Infusion	Akashganga	E-Choupal	

	Tata Kisan Kendra		
<i>Customization</i>		Gyandoot	Drishtee
		Jagriti E-sewa	RASI
		N-Logue	Lok-Mitra

There are five e-government projects in the "Interact" phase. The 'e-Choupal' project is classified in a cell (Infusion, Interact) as it provides farmers with valuable suggestions and opinions and clarifies the questions, as well as providing information on government plans. The "Gyandoot" project is classified as (Personalization, Interaction) because it uses local (Hindi) languages for interaction with citizens and provides education, as well as recording citizens' complaints and addressing them. The "Jagriti E-Sewa" project is in phases (Customization, Interaction) as it provides the latest information to the rural public in local languages and allows e-commerce transactions (d-commerce calls, dstands to depress locales). The "N-Logue" project can be classified as (Personalization, Interaction) as the project provides farmers with information on the market, climate and soil, as well as facilitating public redress of credits through which citizens can interact with government officials. The "Bellandur" project is classified as (Personalization, Interaction) as it preserves citizens' financial records and their birth and death certificates, as well as allowing interaction between the members of the village.

There are three e-government projects in the "Transact" phase. The "Drishtee" project is classified as (Customization, Transaction) because the project allows the purchase and sale of agricultural products and services online, as well as issuing ration cards while maintaining a database of citizens and their economic status. The "RASI" project is divided into phases (Customization, Transaction) as it facilitates the purchase and sale of basic products online, provides information on marketing conditions and facilitates interactive online training for citizens. The project 'LokMitra' is classified as (Personalization, Transaction) because the project provides a user interface in the local language, allows you to buy / sell, allows you to update the address and other information of citizens and allows the public to share their ideas through online interaction.

V. SUGGESTION & RECOMMENDATIONS ON E-GOVERNANCE

Below are some recommendations based on case studies of typical rural e-government projects implemented in India. These solutions are classified into operational, economic and personal.

A. OPERATIONAL

- **Connectivity problems:** telephone access connectivity in rural areas is subject to interruptions due to faults in the telecommunications network. WLL technology allows continuous access. Wireless cellular technologies (WCT), advanced in the United States UU. and the European Union may offer additional solutions to connectivity problems in rural areas.
- **Lack of electricity:** the operational obstacle due to power outages is quite common in rural areas. Solar panels and UPS are useful for providing energy backup in the event of power failures.
- **Rural sector data:** given that there is little information available on the rural sector, it makes it difficult to propose appropriate services in the system. Research studies should be conducted in rural markets to create the necessary information.
- **Non-standardized processes:** process standardization and audit performance will reduce the problems associated with non-standard processes and help integrate information systems in geographic locations or subsystems.
- **Infrastructure:** it must be improved by providing air-conditioned rooms to accommodate kiosks in the villages, reducing operational problems associated with the dusty environment. The addition of modern hardware and software will help provide easy-to-use systems for the rural public.
- **Local Languages:** Since most of the rural population is illiterate in English, user interfaces designed for local languages facilitate adoption.

B. ECONOMIC

- **Lack of funding:** the most common economic obstacle of many projects is the lack of adequate funds to acquire the necessary infrastructure to implement a system. The government should help citizens to grant interest-free loans and installment loans, promoting a public-private partnership.
- **Assistance to the poor:** the poor can not establish their own kiosks for financial reasons. To overcome this, project implementation companies must work together with financial institutions to facilitate support. Project implementers must help the poor find resources to install kiosks, such as initial deposit and periodic payment.
- **Development of kiosks:** if many services are initially added, the cost of the operation will tend to be high; This will discourage citizens from using kiosks because of the complexity and cost of the system. Developers must build the Web site in phases and add services as needed. For example, before implementing the project for the publication phase, followed by the interaction and transaction phases.

C. STAFF

- **Technology adoption:** rural populations may sometimes not accept the project until they are convinced of benefits (for example, Akashganga). Implementation teams must train villagers to motivate them. The designation of local staff as kiosk operators will help to easily interact with users.
- **Favorable environment:** expert trainers are sometimes not willing to visit remote villages due to inadequate facilities. To attract trainers to villages, groups of villages can be formed and modern facilities for each group can be provided, which provides cheaper facilities.
- **Unskilled villagers:** the operation of complex kiosks requires qualified personnel, which is rare in villages. Young villagers who have skills in this job should receive solid computer training. Below are some recommendations based on case studies of typical rural e-government projects implemented in India. These solutions are classified into operational, economic and personal.

VI. CONCLUSION & DISCUSSION

Electronic government (e-Government) is one of the most important ways to bridge the digital divide in developing countries like India. The various government initiatives through ICT developments have helped electronic governance to take off from the start of the millennium. Several constituent elements, such as increasing literacy rates in rural areas, initiatives such as the Digital India campaign will help rural populations to acquire more technological knowledge, encouraging them to contact the Indian government with a click. So, in summary, it can be concluded that the increase in digital literacy with the help of technical progress is leading and will lead to rural development in India.

In the e-government projects described above (Table 1), most of the projects have been adequately designed up to the last phase (customization) of the project, while only a few have reached the last phase of implementation (ie the transaction phase).). This suggests that future projects should be designed and implemented with an incremental approach to get all the benefits. Furthermore, there is little evidence of citizen participation in the decision-making process of the government. Future e-government applications may consider electronic voting and e-mail campaigns, so that citizens can express their views on public policies on food, transport and the environment. The use of new technologies will allow governments to provide the aforementioned services in a more meaningful way. However, governments must carefully plan their regulatory procedures to encourage competition and stimulate innovation.

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