Bridging The Digital Divide Through Electronic Knowledge Based Panchayat

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Abstract
The e-Panchayat initiative is useful in that it can connect to users at different levels – cheaply and effectively. Tremendous amount of data and information can be used in more effective and transparent ways. Connectivity aligns e-Panchayat efforts with other government efforts in e-Governance, education and health services and many more.

The state governments have created several Panchayat Raj Institutions (PRI) to ensure grassroots level development at village level. The Gram Panchayats are there, these are grassroots level institutions. At the intermediate level, i.e. Tehsil/Block/Mandal level there are nodal executive authorities they co-ordinate the implementation of welfare schemes and services.

e-Panchayat is a software product conceptualized, designed and developed with the active involvement of the stakeholders at lowest administrative level and is implemented in Palwal Block and spreading initially to Faridabad District of Haryana State. The Palwal Development Block is located between the geo-coordinates of 28° 05’ 52” to 28° 14’ 10” N, and 77° 11’ 24” to 77° 32’ 48” E and is having 124 villages and 102 village Panchayats.

Keywords
- e-Panchayat – electronic knowledge based Panchayat
- PRI- Panchayat Raj Institution
- SMART- Simplicity, Morality, Accountability, Responsiveness and Transparency
- GP- Gram Panchayat
- BOO- Build Own and Operate
- EPANCH- e-Panchayat
- VIS- Village Information System
- LIS- Land Information System
- CSE- Common Service Center
- VOIP- Voice Over Internet Protocol
- WLL- Wireless Connection
- VLE- Village Level Entrepreneur
- SCA- Service Center Agency
- MIS- Management Information System

Introduction
A technology driven methodology leading to transparency, improved productivity and an existing business opportunity. The electronics Governance has become an accepted methodology involving the use of IT to providing information speedily to all villagers and citizens, improving public services, improving administrative efficiency. Quite obviously, therefore the objective of achieving e-Panchayat goes beyond mere computerization of stand alone back office operation. The e-Panchayat initiative is useful in that can connect to users at different levels- cheaply and effectively. Tremendous amount of data and information can be used in more effective and transparent way.

e-Panchayat has been designed taking into consideration all the information and knowledge management requirements in a Gram Panchayat. The 1992 Panchayati Raj Act of Government of India and the success stories of the Gram Panchayats in various states in the country have been taken into consideration while developing e-Panchayat. Thus e-Panchayat fits well into information systems at Gram Panchayat level. The software is web enabled, and citizen-centric. Therefore, even with fewer overheads the village level functionaries and the citizens are envisaged to benefit by e-Panchayat.

Institution of Governance in the Field
The state governments have created several Panchayat Raj Institutions (PRI) to ensure grassroots level development at village level. The Gram Panchayats are there, these are grassroots level institutions. At the intermediate level, i.e. Tehsil/Block level there are Block Samiti authorities they co-ordinate the implementation of welfare schemes and services. At district level there is Jila Parisad that implements the schemes at grass root level. We differentiate basic three terms interrelated with each others are e-Government, e-Administration, e-Governance, where e-Panchayat is the unit key. Three are different from each other.

e-Government: inter-organizational relationship, including policy coordination, policy implementation and public service delivery.

e-Administration: Intra-organizational relationships, policy development, organizational activities and knowledge management.

e-Governance: Interaction between citizens, government organizations, public and elected officials, including democratic processes, open government and transparent decision-making

e-Panchayat Architecture and Features
The idea behind e-Panchayat is to streamline the administrative processes and conserve resources at every village resulting in development and empowerment of citizens with efficient and responsive local administration.

e-Panchayats architecture is web based n-tiered. It functions like Application Services Provider for all Panchayat providing digital services to all the stake holders. The stake holders are
Citizens, Elected Representatives, Gram Panchayats Officials, the Government and the Knowledge Workers. At Panchayat level an ordinary client with internet access is sufficient to implement e-Panchayat. Most of the computation is done locally; the reporting and association communication takes place through available network for a very brief period of time. Thus field level units can conserve a lot of communication cost and at the same time ensure the uniformity & quality of e-Governance services.

The EPANCH Application Server Software would be having four main modules.

- Administration Module
- Management Information System Module
- Citizen Services Module
- Elected Representative Module

The Administrative Module would help the Gram Panchayat officials in executing their duties and responsibilities delegated to them. The MIS Module would envisage facilitating the state level Gram Panchayat planning, finance and revenue Department officials. The Citizen module would be the one-stop and non-stop provider of all the services to the citizens. The Elected Representative module would go to render services to the elected representatives. The multi-media based information dissemination software, the bio-metric based attendance monitoring software etc., can also be the part of this e-Panchayat to facilitate empowerment through simplicity, morality, accountability, responsiveness and transparency (SMART) at the Panchayats.

**e-Panchayat Features**

The main features of e-Panchayat would be:

1. Below Poverty Line – Enumeration
2. Village Level Planning
3. Meetings Management
4. Self Help Groups related information management
5. Monitoring Attendance in GP Meetings
6. Managing Information related to the meetings at Block/District officials
7. Managing Information related to the assignments to the superior officers related to the village
8. Managing the Information related to the GP property
9. Managing Information related to the weaker section housing program
10. Encroachments related information maintenance
11. Gram Panchayat registers computerization
12. Communicable diseases related information management
13. Tax Demands, receipts generation, revenue accounting
14. Anti Malarial Spraying related information management
15. Crop related information management
16. Anganwadies related information management
17. Tree plantation and protection related information management
18. Maintain sanitation related information
19. Planning and Implementation related information management
20. Relief and Rehabilitation related information management
21. Untouchability eradication programmes related information management
22. Maintaining Information for organizing Literacy classes
23. Birth – Death registration related information management
24. Crop coverage information management
25. Marriage registration information management
26. Gram Sabha beneficiaries information management
27. Property Details information maintenance
28. Managing Information related to Village level events to inform public
29. Maintenance of agriculture statistics
30. Managing information to assist in loan recovery
31. Managing information related to government programme for public participation
32. Maintaining information to inform police about unlawful incidents
33. Managing the information related to village teachers for better laisoining
34. Managing information to organize meetings for community work
35. System to report accidents immediately to higherups
36. System to ensure co-ordination among all departments right from village level to state level
37. Managing information related to the old age pension schemes
38. System to provide marking services
39. Managing information related to the community welfare and development

Other information related to villages can also be included like VIS, LIS and many more...

**e-Panchayat Implementation Model**

The main objective is to ensure successful implementation of EPANCH in all the Panchayats, in shortest possible time with least amount of resource and overheads by the Government. The following strategy is suggested. The Commissioner Panchayat Raj and Rural Employment need to buy only the servers. At Grampanchayats, on Build Own and Operate (BOO) basis the systems can be facilitated through a self-employment generation scheme. So that in each village one or two families shall able to get their livelihood by rendering services to the citizens and the GP officials by operating and implementing e-Panchayats. For rendering the services, the service charges can be fixed. It will be the entrepreneur’s responsibility to collect and feed data, and generate report. The amount of data feed and the number of records generated are

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monitored through software and accounted for making payments. The system maintenance, procurement, internet connectivity and associated logistics shall be taken care by the entrepreneur.

The Citizen Services would be focused on:
- Birth & Death Registration and Certification
- House Tax Collections
- Old Age, Widow & Disabled Pensions
- Trade Licenses
- Layout Permissions
- Grievances Monitoring

**Implementation Structure of Common service Centers (CSE):** Basically this is 3-Tier Architecture Model for e-Panchayat implementation

**Methodology**
- Collation/compilation of spatial & non-spatial secondary database.
- Identification of data gaps & collection of primary spatial & non-spatial data to fill these gaps.
- Vector Data Generation.
- Integration of spatial & non-spatial database and analysis.
- Identification of intervention areas through Thematic Maps generation.
- Developing integrated e-Panchayat (EPANCH) Module System.

The aforementioned methodology will be executed in four different phases to achieve the goal. In first phase spatial and non-spatial database will be collected from primary and secondary sources and the second phase will be including vector data generation. These two phases will be carried out simultaneously. Formatting, data integration and analysis of spatial and non-spatial database will be carried out in third phase. And in the next and last phase various thematic maps and EPANCH Application Server Software would be generated having four main modules.
The current application will be containing the spatial (maps) and non-spatial or attribute data. All the data will be used for analyzing and presenting with the help of different analysis that will be provided in the application. Processed data can be stored in various forms as images, paper maps or tables. Various functionalities, which will be present in the application, are given below.

Display
Map viewer – it is the window where, different maps are displayed. Various thematic maps generated also will be displayed in the window.

Navigation Tools – these tools are helpful to view the maps in map viewer they include the following functions.
1. Panning
2. Zooming
   - Zoom full extent of all layers
   - Zoom to the selected feature
   - Zoom to the active (editable) layer
   - Fix zoom in/out by 50%
   - Zoom in/out by a tool, which can zoom a point or area on screen

Information tool – The attached Information with spatial objects such as State/district/village of interest shall be displayed in a separate window while using this tool.

Layer management – it will involve selecting the desired layer(s) belonging to spatial objects of point, line or polygon. The option for visibility of the label will also be provided.

Multiple map viewers – it will be containing four small map viewers containing same map such that the navigation tool will have effect in all viewers. This viewer helps the user to do periodical analysis of various data features in the application. For example analysing the census data of 4 consequent decades can be done in this viewer.

Analysis
Thematic – this is to analyses the attribute data by creating the thematic maps. Various types of thematic maps provided would be as given below.
- Bar charts
- Pie charts

Customized Buffer /Proximity – buffer can be generated around any spatial object (point, line or polygon). This tool will be customized in terms of selecting single or multiple objects. It also displays the data of features pertaining to a single layer that falls in the generated buffer.

Database
Linking the external data – it facilitates to link the external data, which is not present in the application. The criteria to establish a link are a common field between the current and the external database of interest.

Appending the external database – this functionality is to update the current database with a relevant external database. It helps the user to update any further changes in the same application. For example a district collector can attach all the data of villages and he can maintain them from this application itself.

Queries
Searching tool – it helps in searching a spatial object using their non-spatial or attribute information.
Logical query builder – searching the group of objects (Districts/Villages) with logical criteria. Various logical operators that will be incorporated are as given below.
- Equal to =
- Not equal to <>
- Greater than >
- Greater than or equal to >=
- Lesser than <
- Lesser than or equal to <=
- Boolean operators AND, OR

Measuring – this tool will help to measure the distance between two or more number of points mentioned by clicking the points on the map viewer.

Customized Pre-defined queries – These queries will be created based upon user input and the outcome of the initial social and data creation survey that will be done.

Data presentation/Output
Report generation – generating reports for the data selected by using various tools in the application. For example the objects, which are selected from customized buffer analysis, can be created as a report using the non-spatial data of the corresponding objects.

Preparing Maps – producing maps with their legends (if present) in a standard format will be provided. These maps can be saved as image or can be used to take the printouts directly.

Preparing graphs – preparing bar graphs or line graphs for printouts or presentation purposes using the database will be facilitated.
Development Methodology
The methodology adopted for development of software package will follow internationally accepted IEEE standards. Some of the key elements of the process are:

1. System/Information Engineering and Modeling
2. Software Requirements Analysis
3. Systems Analysis and Design
4. Code Generation
5. Testing
6. Maintenance

Current Implementation Status
For sustainable socio-economic development at the grass root level, a wide involvement of the communities and businesses would need to be ensured. This would automatically warrant forging of sound business relationship based on transparency, mutual good will and benefit. e-Panchayat offers unique opportunities for establishing inter as well as intra stakeholders partnership at the grass root level.

Realizing this fact Govt. of Haryana would have to decide the implementation of e-Panchayat system in all the major Gram Panchayats of the Palwal Block. They have to provide training, hardware and other necessary infrastructure to the village Panchayats. To ensure sustainability, they have to involve village level entrepreneurs owning a computer, obtained through district administration and internet connectivity.

Challenges in e-Panchayat implementation
- Infrastructure development
- Law and public policy
- Digital divide
- E-Literacy
- Accessibility
- Trust
- Privacy
- Security
- Transparency
- Standards & interoperability

CONCLUSION
It must be understood that all of the aforementioned efforts are aimed at using Information and Communication technologies to embed good governance principles. This not only involves empowering masses with information but also making governance an interactive process facilitating transparency and accountability in the public sphere, thereby providing operational convenience in accessing government services, among many others. A website is only the first step. There are many more. The will to operationalise the promise is more important. e-Panchayat aims to cover all information requirements of the village Panchayat, both from the staff angle and the citizen angle. E-Panchayat is already operationalized in several pilot villages in AP. A rollout plan for implementation at the national level is being taken up sincerely.

FUTURE SCOPE
For sustainable socio-economic development at the grassroot level, a wide involvement of the communities and businesses would need to be ensured. This would automatically warrant forging of sound business relationship based on transparency, mutual good will and benefit. E-Panchayat offers a unique opportunity for establishing inter as well as intra stakeholders partnerships at the grassroot level.

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