Development Informatics towards Rural Economy

Because of satellites Television, Telex and a host of other communication technology, we are now better informed of what goes on not only in our own country but in other countries as well. Not all the generated and available information is useful but in order to determine what is useful and what is not useful, it has to be collected, stored, evaluated and used, stored or discarded as appropriate. These processes are costly and time consuming.

The data collected for the micro study of the Mysore district as presented in chapter-2 lacks correlative characteristics which restricts its use to build up integrated systems for development. Massive investments have been made for Rural Development in our country. The development process, therefore, has to be effectively managed (controlled and monitored). An integrated system with an in-built mechanism for measurement of various development indicators needs to be established. Measurement implies availability of right type of data at the right time. Thus an infrastructure has to be designed for data gathering, storing, analysis and dissemination process. Building such Information infrastructure for Rural Development can be termed as "Development Informatics"
The inherent complexity of the Rural Development process has part of its solution in using appropriate information systems to evolve models that can give direction for change and improvement. Thus there cannot be a single model which can ultimately solve all the related issues.

Present day technology offers alternative solutions to the Development Informatics. This has led the author of the present investigation to suggest an approach that reinforces the utilisation of Information systems that would accelerate the development. Some important issues of this Information system are dealt in the following pages.

The professional approach for creating this structure consists of Gathering, Storing, Analysis, Retrieving, Dissemination, Accessing, Utilisation and recycling of data. The powerful combination of computers, communications and storage technologies can offer cost-effective solutions to these.

**Data Collection (Gathering)**

The traditional gathering process of information has been through books, Journals which has inherent limitations of language, speed and capacity. The application of computers in the production of newspapers and magazines has improved the gathering process. The limitations of printed media were solved to a good extent with the introduction of electronic media like the radio and TV. Information heard or seen has the limitation for recording and replay in a universal way. For example, there is no provision for gathering of the beamed information through TV or Radio for those who miss or for those who want it again. The next generation of gathering was on microfilms, magnetic tapes and Optical disks. The gathering of information...
in the focused area has still the traditional approach which is error-prone for gathering large volumes of data at the grassroots level. It is suggested that the latest techniques of information technology be used for gathering the data from the grassroots level. This gathering process becomes extensive and exhaustive both in terms of speed and accuracy.

Data Storage

Speaking from the traditional aspects, the generated data has been stored from times immemorial, starting with clay tablets, stone inscriptions, papyrus, leather scrolls to paper back with the introduction of printing. The kinds of data has largely been textual in nature. Difficulties have been encountered in the process throughout the history of data storage because of the exponential increase in the volume of data. The current technology offers storage capacities that can handle large volumes of data. Technology also offers the possibility of distributed storage of data-for instance the data storage can take place at the place of the origin. This also helps in storing accurate data without distortion.

Currently there are two types of stored data: Analog and Digital. The Analog type of storage is characterised by higher capacities but the stored data is difficult to process by digital computers. E.g., Audio and Video cassettes store data in analogue form. Digital data storage is resorted to in particular to improve communication and computational aspects. The current storage capacities are in terms of thousands of gigabits. For example, one CD-ROM disk can hold 660 Mega bytes of information (approximately 2.7 lakh pages of information)- equivalent to about 30-volume set of an Encyclopaedia. The latest storage technology also allow for better security, have long life in addition to the size and speed of storage. The storage devices also
provide accurate and faster retrieval which means more data is available for analysis

The increase in storage capacities coupled with advances in compression techniques have made it possible to save images in digital format which has advantages over the analogue format in terms of speed of access and easy processing.

Availability of low cost scanners and digital video cameras are making it possible to convert existing paper based documents to digital form. Multimedia is the latest advancement which tries to combine audio, video and digital forms of data. It has opened up new avenues for integrated data storage.

GIST (Graphics based Information Systems) is a indigenous technology developed for application in Indian languages. The DOE has standardised a code for the representation of Indian languages in the shape of the Indian Standard Code for Information Interchange (ICs). This helps storage of data in Indian languages which gains significance in the application of appropriate technology.

**Data Analysis**

Analysis is the most important aspect of Information Technology. Data gathered and stored can be better analysed for forecasting. E.g., Monsoon forecast, flood warnings, earth quake warnings and the like. The progress of a particular project or scheme can be assessed in its entirety using analysis tools like spread sheets, statistical analysers, 'what-if' analysers.

(DoE  Department of Electronics)
Computer based tools (application packages and programming languages) are available to test and evaluate alternative development models. By this, it is possible to comprehend the feasibility of a particular model before the actual launch. Object oriented methodologies (analysis and programming) are available for building large applications. The advantage of Object Oriented approach is its inherent simplicity in the development of systems / models which are close to real world situation. This is the recommended approach to represent and / or solve complex problems.

**Data Dissemination**

The utility of data is enhanced by proper dissemination. The dissemination has grown from the traditional word-to-mouth to sophisticated global dissemination through teleconferencing, e-mail, facsimile (FAX) and the like. As a process of communication, dissemination had a very limited scope in terms of content, accuracy and the spread even from the point of view of a small village. Important issues could not be disseminated properly and effectively resulting in impediments for growth. The role of public libraries as rural information centres in guiding the communities is another traditional approach. The technology has overcome all these with mobile libraries taking information to the doorsteps of the people. The other mass media like Radio and Television have increased enormously the process of dissemination in their specific programmes designed and developed for rural development. These effective media have the advantage of improving the awareness of the rural population.

Advertisement is another important mode of data transfer. A majority of scientific and professional data is also being disseminated through Selective Dissemination of Information and various other Current Awareness Services which are being effectively used by scientific and academic organisations.
both commercial and non-commercial covering national and international scenes. This dissemination structure works wonderfully to be adapted with modifications as problem solving at rural level by developing appropriate data packages.

**Data Access**

Data Access is by and large the need of an individual or corporate. In both the cases, approach could be for a specific data item. There is heterogeneity in the type of individuals who approach for data access. Since the volume of data produced is huge, the access becomes slow, difficult with more of noise which results in less relevance value.

The traditional way of access to data is through Indexing mechanisms, like Keyword in Context (KWIC), Keyword out of context (KWOC), Citation analysis, and natural language search. These are developed with multiple point access using dictionary and subject thesaurus and produced and updated constantly. The QBE method (Query By Example) has a good solution in that it can offer a logical and quick method for data access. Hypertext offers yet another convenient access mechanism.

The situation of access to data has drastically changed with the development of information technology and communication technology. These have resulted in virtually instant access to very large amounts of data with time and distance tending to zero. The development of these technologies have greatly helped in the creation of information networks. We have the best examples in Indian context of networks like NICNET, INDONET, ERNET, I-NET etc.
Data Utilisation

The utility of data is greatly enhanced if presented properly. Active research has been carried out in the area of Human-Computer interfaces. The information infrastructure manifests itself differently in various sectors of rural development as it is multi-dimensional. To enhance the subsystems of the sector to be managed also differs depending upon the stages and levels of interaction. The traditional approach of resolving the issues used to have highly limited scope both in terms of horizontal and vertical conception of the problem. In situations like this, the planning and its assessment never used to be totally objective and result oriented. This results in problems being never solved in its entirety. The data utility gains importance to look at the problem in synergistic way. There are various management information systems which aids model such problems.

By using graphic representations, more information can be conveyed with less efforts, minimum time and more effectively which enhances user’s perception of what is conveyed. The case in point is the meteorological data which is being flashed. Most of the data presentation packages come with comprehensive on-line help which adds to its utility factor.

Data Recycling

The last link in the chain of management information system is feed back or data-recycling which is the consequence of all the other operations. This is a continuous process in the data generation and utilisation process. The process of recycling helps in generating more data by incorporating corrections at all levels and within the levels to improve and give a concrete direction to solve the problems on hand.
The total process of development informatics thus revolves around developing a heuristic design with an in-built capacity for constant updating which is helpful to the user as compared to the existing situation, particularly the rural sector where there is no database. As a nation, to solve our most complicated and intrinsic problems, the concept of creation of databases from the grassroots level has begun which augers well. The information society concept that is being realised in this process where the heuristic designs of information systems should be closer to the user than to the database themselves. The National Information Centre network (NICNET) has built over 650 nodes covering all the district headquarters of governmental data with DISNIC (District Informal System Network) as their nodal points.
Information for Development: 
An analysis of its perception by end users

The perception of the role of information in development projects is an important criterion. For this purpose, interviews were held with a chain of personnel involved in the development process. A set of criteria indicating the multivariate role of information in different stages of projects was presented to the interviewees to get their response. The data so gathered is tabulated with analysis.

The perception of the role of information in developmental programs is of multiple use. The development planner perceives a set of goals to be achieved which are yet in an uncertain stage. The end beneficiary wants the concrete experience of developmental impact. The intermediary in between look at information as a varied input to each stage of action. In order to gain a first-hand experience of the variance of this perspective about the role of information in development planning, a person to person interview was undertaken. This criteria runs through the entire thesis and is correlated in the concluding chapter appropriately.
The criteria for developing an information package can be broadly grouped as under, and are analysed with personal interview method which covers some representative segments of rural sector

A) Social segment

The information package helps to exchange the quality of life. A pattern of widespread information consciousness and end-user access to quality information. The role of public libraries as disseminators of the required information, role of various government departments, non-governmental organisations, to bring general awareness of the fast-changing scenario of mass media like TV, Radio, local transport and communications, has to a certain extent cut into rural-urban divide and their impact on their life styles.

B) Economic segment

This is a very wide segment of the rural development sector. Precise information packages as resources, products, processes and services need to be developed. This will be a source of added value and employment. The gap in the subdivisions of the segment have to be reduced with built-in action plan to bridge the gap and give the system the sustainability for growth. The packages under each segment has to take note of the existing design and the inputs for development in the light of the changes that are taking place for a coordinated and integrated development of the rural sector.

C) Technology segment

The organised information package in this sector becomes the key enabling force. Its widespread diffusion can be contemplated starting from a smokeless kitchen stove of the village home, using biogas and electricity, to agricultural, non-agricultural and other village industries for their establishment, maintenance, and sustenance.
D) Cultural segment
Information package in this segment will have to take care of the important cultural heritage and values. The folklore, in all its manifestations, historical monuments, archives, artifacts, temples, churches etc. These will help reflect the panorama of the past, for a better understanding of the present and for the posterity. This will boost the development of tourism. This package covers both national and individual development.

E) Education segment
Information package covers the existing pattern and design of the formal, primary, secondary, and higher education with reference to rural development.

F) Political criteria
The information package here refers to the freedom of information access leading to the political process. Creation of local self governments and the increased participation of the peoples representatives for consensus of the total and allround rural development. Finally, information package as a truly independent variable helps rural development in forecasting and assessment, to establish link between technological and social consensus, it acts as an interplay between technological and social issues, envisages development as a continuum.

Interviewee Analysis

The role of an interviewee to assess the perception of information in development project was conducted as indicated in the chart below to get feedback among various operators in the rural development project. In particular use of technologies for the development purpose.
The basic problem was that they could not perceive information as a separate phenomena in the development project. It always got mixed up with target achievement. The resources such as financial, material and human resources was not found as separate information quantities and even this is due to the lack of training / education and assessment of an analytico synthetic approach where one can look impact of each development parameters to lead to different alternatives. The synthesis of these parameters can themselves lead to different alternatives. Thus we find that the perception of information as a separate resource for development is not evident at any stage among the personnel in development process. The result has been, the hindered planning, processing and achieving of sustained development of various appropriate technology projects, even after four decades of independence of our nation.

Chart showing the level of perception of information of various operators interviewed:

<table>
<thead>
<tr>
<th>Category</th>
<th>Background</th>
<th>Level of perception</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneur</td>
<td>Professional</td>
<td>Satisfactory to Good</td>
<td>Exposure to various technical &amp; social issues</td>
</tr>
<tr>
<td>Information Scientist</td>
<td>Academician</td>
<td>High</td>
<td>Specialisation</td>
</tr>
<tr>
<td>Bureaucrat</td>
<td>Varied administrative experience</td>
<td>Satisfactory to Good</td>
<td>Implementor</td>
</tr>
<tr>
<td>Politician</td>
<td>Political worker</td>
<td>Satisfactory</td>
<td>Political reformer</td>
</tr>
<tr>
<td>Beneficiary</td>
<td>Varied</td>
<td>Satisfactory</td>
<td>Enduser</td>
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</tbody>
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