INFORMATION AND COMMUNICATION TECHNOLOGY IN FURTHERANCE OF GOVERNANCE – SOME USE CASES

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Abstract: ICT applications are useful and supportive in numerous instances to facilitate the sustainable development, in the fields of public administration, business, education and training, health, employment, environment, agriculture and science within the framework of national e-strategies. This paper describes some use cases of application of ICT in public life in India.

I.   INTRODUCTION

Information and communication technologies or ICT is about digital information passing between devices. The most prolific example is the Internet, a worldwide network of computers linked together by telephone lines. There are, however, other examples like mobile phones, interactive television and personal organisers (Cronin, 1994). When ICT is applied in businesses it can lower costs, raise productivity and improve customer & supplier relationships. In learning, ICT widens participation and raises attainment. In public services, ICT engages people with services more effectively and in communities ICT links people to economic opportunity and brings together those with common agendas. We see the letters ICT everywhere - particularly in education. But what does it mean? A brief introduction to this important and fast-changing subject follows (Knudson, 1994).

ICT is an acronym that stands for **Information Communications Technology**. However, apart from explaining an acronym, there is not a

universally accepted definition of ICT. Why? Because the concepts, methods and applications involved in ICT are constantly evolving on an almost daily basis. It is difficult to keep up with the changes - they happen so fast. Let us focus on the three words behind ICT:

- **Information**
- **Communications**
- **Technology**

A good way to think about ICT is to consider all the uses of digital technology, which already exist to help individuals, businesses and organisations use information. ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form, for example, personal computers, digital television, email, and robots (Lindsey, 1994).

So ICT is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. Importantly, it is also concerned with the way these different uses can work with each other. In business, ICT is often categorized into two broad types of product: 1) the traditional computer-based technologies (things you typically do on a PC at home or at work); and 2) the more recent, and fast-growing range of digital communication technologies (which allow people and organizations to communicate and share information digitally). Let's take a brief look at these two categories to demonstrate the kinds of products and ideas that are covered by ICT (Roberts, ud).

II.   BPR IN HARYANA EDUCATION BOARD

'Business Process Reengineering,' the new management buzzword, has its relevance in Government too, and ICT plays a vital role in reengineering any organization. Before the start of the reengineering exercise in Haryana Board of Secondary Education (HBSE) in 2003, there was rampant corruption with a nexus between scheming schools, officials of the education department & board

and teachers which made Haryana infamous for widespread copying. The system was unjust to the meritorious candidates. At this stage, fundamental rethinking and radical redesign of the system was carried out using ICT interventions, keeping client-focus as the ultimate objective. All these initiatives in the examination system ensured that copying was eradicated from the state.

Why Reengineering?

To identify the areas of problems and approach them in a systematic way, a study of the various aspects of functioning of the board was conducted. Feedback was taken from the various stakeholders, viz. teachers, schools, parents, board officials etc. A comprehensive database emerged on the basis of extensive interaction with the masses and media. The various pitfalls identified in the process were:

1. Rampant corruption
2. Lack of transparency
3. Too much dependence on the officials
4. Obsolete and outdated processes

The organization required restructuring and redesigning, which would weed out obsolete and irrelevant aspects of functioning and focus only on those that served the clientele in the most optimal way. While formulating policies and designing the reengineered processes, brainstorming sessions were held. Officers were motivated to participate and give innovative solutions. A four pronged approach was adopted:

1. Analyze the problem threadbare in its entirety,
2. Reengineer the whole mechanism,
3. Galvanize every stakeholder into action, and
4. Ensure ruthless implementation of the new policies.

ICT Initiatives for BPR

Based on the principles of BPR, the value stream processes were identified. Certain activities were off-loaded outside the organization to give maximum

advantage to the examination system. NIC Haryana State Centre, NIC Bhiwani District Unit and NIC HQ at New Delhi provided requisite ICT support to the board. The role of ICT as an enabler in the entire process was given due importance. The various ICT interventions included:

− **ICR scanning for pre-phase work:** Integrated Character Recognition (ICR) scanning was introduced wherein the photos and signatures of candidates were scanned and printed on admit cards and certificates. This provided an effective check on the evil of 'impersonation' which was often resorted to in the previous examinations.

− **OMR scanning for post-phase work:** In the past, gross irregularities were reported, when award sheets were replaced by some officials. Newly designed Optical Magnetic Recognition (OMR) sheets rule out any possibility of manipulation. The new system is accurate, fast and ensures secrecy. HBSE becomes the first public examination body in the entire country to introduce scanning both in the pre and post phases.

− **Enrolment procedure:** The concept of BPR says that information should be captured once and that too at the source. This principle was used in reengineering the enrolment procedure. By this innovative practice & simplification, efforts of duplicity in dealing with data was avoided.

− **Automation of Centre Allocation:** HBSE became a pioneer in allotting centres through computerization to the candidates. This injected transparency and accuracy into the system.

− **e-results:** Now, the candidates can get their results through Internet, Interactive Voice Response System (IVRS), Helpline and through various mobile services. NIC provided the necessary assistance for providing e-results.

- **Admit cards on website:** With the help of NIC, HBSE took another leap forward by displaying the admit cards of private candidates on its website. So, the candidates need not worry about receiving the cards in time.

- **Automation of accounts branch:** All the receipts and payments have been computerized and various reports can be automatically generated.

- **Data Collation:** Earlier, the database of results was not updated and thus, the only resort to check eligibility was through huge gazettes. With the negligence/connivance of the board officials, various ineligible candidates could misuse the system. To tackle this problem, checking eligibility has become an easy job by way of data collation/conforming. Dependence on the staff has reduced and the system has become fool proof.

III. CASE DATA INFORMATION SYSTEM AT JHARKHAND HIGH COURT

On 16th March 2007, 'Case Data Information System' (CDIS), a web-enabled database system keeping record of all information related to court cases, was inaugurated at Jharkhand High Court. Through a web-based interface, status of cases of the High Court and can be accessed online through URL http://www.jharkhandhighcourt.nic.in. The CDIS allows searches for individual cases, department, police station, petitioner & respondents wise cases also. The CDIS will enable litigants, advocates and government officials to know the exact status of cases and the last order passed on them. It is expected that the new system will be of immense benefit to the government officials as well. The CDIS has been designed & developed by NIC Jharkhand State Unit.

IV. ICT AT DEPARTMENT OF ANIMAL HUSBANDRY AND DAIRYING

The Department of Animal Husbandry & Dairying (DAH&D) is responsible for formulation of policies and programmes in the field of animal husbandry, dairy development, and fisheries. The Vision-2020 Document of the Ministry of

Agriculture envisages that "the tools of ICT will provide networking of Agricultural Sector not only in the Country but also globally and the Centre and State Government Departments will have reservoir of databases" and also "bring farmers, researchers, scientists and administrators together by establishing "agriculture online" through exchange of ideas and information". The Ninth Plan sub-committee report has recommended to build up reliable databases and network based information systems for all activities of the Animal Husbandry and Dairying Sector, at district, state and national level, using NICNET facilities, to strengthen "Animal Production and Health Information System Network (APHNET)".

The Department, in collaboration with NIC has been taking various measures to promote ICT since 1995, with the objective of making "Indian Livestock on-line". The DAH&D has already established a Local Area Network (LAN) with 230 nodes at Krishi Bhawan with Internet access through NICNET gateway.

An ICT Learning (e-Learning) Centre has also been established. During the period of "Bird-Flu" situation, the country update on the "Bird-Flu Situation" was regularly updated in the Department's Website (http://www.dahd.nic.in. The National Project on Rinderpest Eradication (NPRE) Directorate has established a "Close-User-Group" Network with its agencies at State/UT levels for Project Monitoring and Evaluation (M&E) and also connected to NICNET through RF connectivity for Internet accesses. In the overall strategy of ushering in e-Governance paradigm in the DAH&D, it has been envisaged to strengthen ICT Apparatus in (i) the DAH&D Head quarters (Krishi Bhawan) (ii) the 44 Field Offices/ Subordinate Offices and (iii) State/UT Departments of Animal Husbandry, Dairying, and Fisheries and upto district level. To carry out the same, NIC has submitted a detailed proposal to the Ministry of Agriculture. The proposal covers components such as establishment of ICT infrastructure and networking, IT empowerment of employees through training programmes,

development of application software, development of Intranet Portal for the Department, creation of Portals in related areas and development of Indian Livestock Production and Health Atlas (ILiPHA) to provide a scaleable overview of spatial and temporal variation of quantitative information related to livestock production and health through the combination of maps, tables and charts. The project will be executed as a "turn-key" project through its various State Units located throughout the country.

V.   ICT AT STATE TRANSPORT AUTHORITY

Road Transport plays a vital role in our economy. During the past 50 years, the number of registered vehicles has grown from a paltry 3 lac in 1951 to 6 crores in January 2004. Earlier, railways used to be the only reliable mode of transport for long routes. However, during these years, the mode of transport for goods on long routes and inter-state routes is switching towards road transport. Pan Indian character of this sector necessitates better control and coordination at the intra and inter-state level.

The state transport authorities control this movement by providing permits to the goods and passenger vehicles from their state. For inter-state routes, National Permit can be obtained from the state of registration. Another important activity in this sector is issuance of driving licenses. The Central Motor Vehicles Act, 1988 (CMVA) forms the basis for processing any request for a new registration, permit or a new license. However, each state has its own Motor Vehicle Rules which form the basis for charging vehicle tax and permit fee. For citizen services, each state has its Regional Transport Office (RTO) or a District Transport Office (DTO) spread all over the state.

Computerization of Regional Transport Offices (RTO) and District Transport Offices (DTO) had been initiated by a number of State Governments, notably Delhi, Maharashtra, Bihar, Goa, Punjab, West Bengal and others.

However, the approach was different for each state keeping in view only the local requirements. The shape of documents was also non-uniform. Some states introduced plastic cards, some smart cards and others continued with the paper-based document.

Opportunities and challenges

The differences in the user perception, local objectives and limited resources lead to widely different levels of computerization, software functionality and level of success. Some of these states where computerization has been done, provide on-line transaction facility, while others provide offline or batch oriented facility. The development of MIS software for controlling such functions is improvised. All the transport authorities aim to serve the objectives relevant to their own state as per their perception. One aspect common to all the state transport authorities was that the creation of a central database to store statewide information and records was not a priority.

Availability of some basic minimum data related to vehicle population in the state and vehicles running on the national routes both across the state border and international border could help the Centre in various ways. It could help in:

− Providing the useful data for planning purposes.

− Locating vehicles reported missing or stolen.

− Better monitoring of the inter-state and National Permits.

− Avoiding duplicate registration of vehicles and thereby avoiding multiple hypothecation of the same vehicle.

− Avoiding issuance of driving license to unauthorized persons.

− Monitoring the inter-state issues in a better way.

Need for ICT

In the year 2000, Ministry of Road Transport and Highways, decided that in view of growing volumes, non-uniformity of document, heterogeneity of data formats and huge cost of application software it was important to evolve and implement

standards. An Apex committee was constituted under the chairmanship of Secretary (RT & H) with representation from the states, industry and NIC with a mandate to evolve common standards for data and the shape of document to be released to citizen at large.

Figure 1. Computerized counter at RTO Chennai

Another technical sub-committee was formed to look into the use of smart cards as the DL/RC document. The Apex committee approved the recommendations. These recommendations, inter-alia, mandated unified data structure for the back end system and unified format for Vehicle Registration Certificate (RC) and Driving License (DL). These recommendations have been circulated to all states and are also available at **http://parivahan.nic.in**. As a follow up, Central Motor Vehicles Rules have been amended with precise definition of Smart Card and specifications of the Smart Card and peripherals to be used to achieve national compatibility/interoperability (Gazette notification G.S,R. No. 400 (E) dated 31.5.2002 and gazette notification G.S.R. No. 513(E) dated 10.8.2004). The provisions also enable States to mandate use of Smart Card based document for which an enhanced fee structure has been prescribed under the rules.

In 2002, NIC and MoRTH signed an MoU to develop core software for Vehicle Registration and Driving License workflow process computerisation with a view to:

- Implement uniform data structure for these two applications to facilitate creation of state and the national registers for DL and RC

- Establish a smart card lab to test the **SCOSTA** (Smart Card Operating System for Transport Applications) compliance of smart cards from various vendors

- Establish atleast one pilot site in each state and UT to facilitate replication either through the state funds or using suitable PPP model

- Establishment of backend system at State level/RTO level through total computerization of records for DL and RC on a standardized software.

- Facilitates ease of access to citizens.

- Making information available to various concerned agencies to perform their task better.

- Documents issued by one State should be readily readable and verifiable in other States.

Technology used for Vahan / Sarathi 2.0

VAHAN/ Sarathi 2.0 is a 32 bit, GUI rich application written entirely in JAVA. It has three-tier application architecture. The components of the tiers are:

- **Database** – This is the bottom most layer or the back end. VAHAN /Sarathi 2.0 supports three databases namely DB2 version 7.2 or higher, Oracle 8i and version 8.1.6 or higher and MSSQL Server 2000 or higher.

- **Application Server** – This is the middle layer which manages the business rule that manipulates the data as per the governing condition of the applications. It provides a database independent interface for applications and makes the front end robust. This application uses the JAVA RMI framework to establish connection to clients. This feature enables a program running on the client computer to make method calls on an object located on a remote server machine. It gives the ability to distribute computing across a

networked environment. The JAVA JDBC framework provides a standard interface to establish connection to the database.

− **Client** – The presentation and control logic is embedded in the client tier. This is the GUI layer of the application using Swing component of JAVA, which will interact with the Application server by means of forms.

Figure 2. Use of ICT at DTO Aizwal

VI. CONCLUSION

In all, four Indian ICT use cases in public life were discussed. Firstly, use of ICT for reengineering the operations of Board of School Education, Haryana, was discussed. Therein ICT has been used for following: scanning of photos and signatures of candidates to check the cases of impersonation, scanning of award sheets, automation of centre allocation, publication of results, date-sheet, admits cards, forms etc. on the web.

Second case discussed the use of information technology for keeping record of court cases' data, which might be used by individuals, counsels, police and government officials apart from judges. Facts related to judicial process relating to individual cases, department, police station, petitioner & respondent wise cases may also be searched.

Thirdly, the use of information technology in formulation of policies and programmes in the field of animal husbandry, dairy development, and fisheries

was discussed. The Ministry of Agriculture, Government of India, seeks to use ICT to network whole agricultural sector not only in India but also globally and the Centre and State Government Departments will have reservoir of databases and also bring farmers, researchers, scientists and administrators together by establishing "Agriculture Online" and "Indian Livestock On-line" through exchange of ideas and information. Fourth, Computerization of Regional Transport Offices and District Transport Offices and development of two software products called VAHAN and Saarthi were discussed.

A common aspect of all the four projects comes out to be that National Informatics Centre (NIC) has facilitated the development, implementation and operations of all these four endeavors. It is important to record tremendous efforts put in by NIC district units, state units and the core teams to ensure time-bound implementation and millions of smiling faces bear the testimony of their work.

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