INTRODUCTION

"Knowledge will forever govern ignorance; and a people who mean to be their own governors must arm themselves with the power which knowledge gives"

James Madison

1.1 Towards a Knowledge Society

1.1.1 **Knowledge and skills are preconditions for development**: Knowledge and skills of the human resources contribute significantly to the economic development and growth of a country. Hence empowering, educating and training of people has become the most important task on the agenda of governments and organizations alike. With the help of Information Communication Technology (ICT), dissemination of knowledge and the capacity to integrate and absorb knowledge have grown immensely. The Internet and related technologies have enabled the flow of information and knowledge and have made it accessible to people at minimum cost. The rapid advances in computers and communication technologies have facilitated establishment of knowledge based societies wherever these technologies have been used intelligently. Realizing the immense potential of ICT tools, many nations across

the world have, over the last few years, incorporated ICT into their national development policy framework. These tools are being used to increase labour productivity, international competitiveness and enrich the quality of life.

1.1.2 **HR initiatives of the Government**: The emphasis on empowerment of citizens with knowledge and skills can be seen in the plethora of initiatives taken by the Government of India and the State Governments in the realm of education, ICT and e-Governance. The emphasis is on the overall development of the citizens by strengthening education and training (pre-primary, primary, secondary and higher education, adult literacy, vocational training and community education), health and governance. IT is an important enabler in the initiatives of the governments in these spheres.

1.1.3 **Knowledge Commission for National knowledge drive**: The Knowledge Commission appointed by the Prime Minister in October 2005 has been assigned the task of preparing a blueprint for radical improvement of knowledge access and knowledge creation and application for the people of the country. The assignment includes generation of practical plans for comprehensive improvement of education standards and opportunities at all levels and notably the uplift of vocational knowledge and skills. The Commission, in its 2006 Report affirms that a national drive to ensure access to knowledge and learning can transform India's potential for development, lift young Indians to new levels of understanding and competence, and make India one of the leading

knowledge societies in the world.[1] The Commission has also emphasized the importance of e-Governance to improve the internal efficiencies of the government and electronic delivery of public services.

1.2 The National e Governance Plan

1.2.1 **Empowering the common man through ICT**: The National e-Governance Plan (NeGP) of the Department of Information Technology (DIT), which was approved on 18th May, 2006 aims to empower the common man through ICT. This is clear from its vision to "make all Government services accessible to the common man in his locality through common service delivery outlets and ensure efficiency, transparency and reliability of such services at affordable costs to realize the basic needs of the common man."[2] The delivery of services to the grassroots level would be achieved by establishing State Wide Area Networks (SWANs), Common Service Centres (CSCs), State Data Centres (SDCs) and Community Information Centres (CICs). The CICs, many of which are already set up in the far flung areas of the country are serving the dual

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[1] Digital Learning, Feb 2007 "People's Access to Knowledge can Transform India: National Knowledge Commission's Report, 2006" (Online)

Available: www.**digitallearning**.in/articles/article-etails.asp?articleid=1006&typ=REPORT - 47k (accessed 28 February 2009)

[2] NeGP Vision, Department of Information Technology (Online)

Available www.mit.gov.in/default.aspx?id=837 (accessed 26 February 26 Feb 2009)

purpose of education and training as well as providing IT enabled services to the local community, government offices and school children.

1.2.2 **Competence with ICT tools a must**: The Government's initiatives on e-Governance have major implications for officers, employees and for members of the community at large. Both delivering e services and accessing them require a certain level of competence with ICT tools. E learning would empower people to make the e-Governance strategy of the nation a success.

1.2.3 **E learning a thrust area of NeGP**: It is pertinent to mention here that e-Learning is one of the thrust areas identified by DIT. The main thrust of e-learning programmes is to integrate them with the traditional classroom system, increase its reach to more and more learners and spread it to subjects beyond IT related subjects.

1.3 Leveraging Human Resources on the Indian Railways

1.3.1 Efficient and effective use of manpower is a must for the Indian Railways: Indian Railways are the second largest employer in the world and the largest employer in the country with a total strength of about 14 lakh employees. More than 40% of the Central Government employees belong to the Indian Railways and account for about 40% of the wage bill of the Central Government. The wage bill, as a percentage of the Ordinary Working Expenses (OWE) of the Railways is in the range of 45% to 47%. Thus, manpower, as a

factor of production carries a high cost. **Making the most efficient and effective use of the manpower implies that along with rightsizing, their skill sets need to be strengthened.**

1.3.2 **Changing the organizational ethos:** Railwaymen touch the lives of millions of railway passengers every day and are the force behind a business running into tens of billions. Railway employees are also the custodians of assets worth thousands of crores. While it is true that a turnaround in the fortunes of the Indian Railways was brought about with the very same Railway employees, it is also true that "one of the challenges facing the Railways today is "attracting and retaining talented staff, creating a culture of cross functional collaboration, increasing accountability across the hierarchy of the organization and spurring innovation."[3] This challenge has to be overcome by changing the ethos of the organisation, by transforming the skills and knowledge of railwaymen, instilling a sense of pride and bringing about attitudinal changes.

1.3.3 **Need for a paradigm shift in the way training is viewed and delivered:** A well designed training programme is critical for the Railways. Therefore, Indian Railways have traditionally given a lot of importance to training and have a well-designed training infrastructure in place. However, rapid technological advancements and rising expectations of service delivery have made it necessary to continuously revisit the training requirements. Training content and

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[3] Kumar, Sudhir and Mehrotra Shagun. (2009) 'Bankruptcy to Billions: How the Indian Railways Transformed' Oxford University Press

delivery also need to keep pace with the changing trends and make use of the best tools available, so that the organization is not left behind in a globalised and competitive world. Further, training also needs to bring within its ambit every Railway employee so that each employee delivers his best to the organization. The scope needs to cover various facets such as knowledge and technical skills, soft skills, awareness of organizational goals, attitude and ethics. Traditional training methods alone would be hard pressed to meet these needs. A paradigm shift in the training strategy, is therefore required.

1.4   Blended Learning

1.4.1 **Combining e learning with face to face delivery**: E learning involves the use of technology to enhance learning including digital collaboration, satellite broadcasting, CDROMS, video and audio conferencing, mobile technology, interactive TV and web based technologies. Many successes use a combination of e learning with face to face delivery. This is currently referred to as 'blended' learning.[4]

1.4.2 **E learning is multi-faceted**: E learning is a generic term that is used to cover training or learning efforts that use computer and communications technologies such as digital courseware and online courses to train or educate. It

[4] Bennink, R. (2004) "Implementing elearning from the corporate perspective". (Online)

Available: http://knowledgetree.flexiblelearning.net.au/edition05/download/Bennink.pdf

(accessed 2 November 2008)

includes training and educational materials delivered over the Internet, intranet, extranet or CD-ROM. Usually, these materials take the form of computer based training (CBT) courses, including distributed learning, distance learning (other than pure correspondence) and Web-based learning. It can be instructor-led or computer-based or a combination of the above.

1.4.3 **Early e learning**: "There is still a "misunderstanding that e learning equates only with learning at a computer, doing boring, text based, online courses with no interaction with a trainer or other learners. This model does still exist, however it is very quickly being replaced with an understanding that learning encompasses a wide range of learning models, with technology an enabler of increased access to flexible, quality and just in time training."[5]

1.4.4 **E learning down the years:** Early computer based learning was primarily text based and involved little or no interaction with the user. As computer technology advanced, computer graphics, animation and sound were incorporated to make CBT more interesting and allow greater interaction with the learner. The introduction of Interactive Video, and later the Interactive Multimedia, has revolutionized the learning environment of this medium. Motion pictures, digital sound and high quality images have made it possible to make learning extremely interesting. The Compact Disc has emerged as a major

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[5] Bennink, op.cit

learning tool in recent times due to its ability to store large amounts of data and is being used to facilitate training.

1.4.5 Blended learning solutions meet increased training needs: Face to face training cannot be done away with due to its inherent advantages. Organisations are resorting to blended training to obtain the best of both worlds and to meet the increased training requirements.

1.5 Statement of the problem:

1.5.1 **Huge training gaps demand urgent steps:** The details of training requirement and availability obtained by the Ministry of Railways from the Zonal Railways, indicate that the training availability (calculated in man days) falls short of the training requirement. The compiled figures for five departments; Civil, Mechanical, Electrical, Signal and Telecom and Traffic (Operating and Commercial, are at **Annexures 1a to 1e**. The figures show that there are wide gaps between availability and requirement of training and indicate the urgency for adopting new technologies to meet the training needs. Moreover, these requirements do not take into consideration the training needs of a sizeable number of employees on the Railways. If these were to be added, the training availability would fall further short of requirements.

1.5.2 **Technological changes are increasing complexity and velocity of the work environment**: In recent years, technological changes are taking place at a

faster rate. Training has to cater to the need to keep employees abreast with the changing technology. The first major change in Technology in the Railways took place when the Railways switched over from steam to diesel and then to electric locomotives as well. A large number of steam sheds had to be closed and the 'steam' staff had to undergo 'conversion training' for being redeployed on the diesel side. In many cases this process was painful and time consuming.

1.5.3 **Multi skilling is the need of the hour**: The changes in technology have necessitated a multi-skilled workforce. There has also been a drastic reduction in unskilled work performed by Railway employees over the years. Coming years are likely to see an almost total elimination of unskilled jobs. The Sixth Central Pay Commission has recommended the upgradation of all Group D employees possessing the prescribed educational qualifications/skill requirement to Group C after necessary training. This has also increased the training requirement.

1.5.4 **Transition from a public utility to a professionally managed organization**: Indian Railways is moving from being just a 'Public utility service' to a commercially viable and profit oriented organization run along professional and business lines. Changes are taking place in the organizational structure, philosophy and very manner of managing the Railways business such as Corporatization of certain activities; private public partnerships and outsourcing of work earlier performed by the Railways, to name a few. These have necessitated considerable changes in the work ethos, knowledge and skills of its employees. Better customer service and deliveries have become crucial. The enactments of the Right to Information Act and Consumer Protection Act have

entailed improvement in delivery mechanism and transparency in the organization. Training of staff, therefore, assumes tremendous importance not only for keeping them abreast with the technological changes but also with the changing role, philosophy, values and ethics of the organization.

1.5.5 **The success of the Railways benefits the entire nation**: As stated by the Minister for Railways in the Budget speech 2009-10, "to make true the dream of financial turnaround, the entire Railway family worked as a team, with out of the box thinking, adapting themselves in tune with customer requirements and bravely faced the ever arising new challenges. This has earned the Railways and its personnel the respect of the entire nation which has in turn imbued railway employees with renewed motivation and a rising morale. The benefits of this turnaround have accrued not only to the Railways and railway employees but also to the people of the country". The Railways cannot afford to rest on their laurels. **Sustaining the turnaround requires a skilled, committed and professional work force.**

1.6 Purpose and objectives of the Study

The purpose of this study is to explore the feasibility of incorporating new tools and methods such as computer based training and e-learning across the Indian Railways for various categories of employees. It is also proposed to examine whether these tools and methods can facilitate in filling the gap between the

requirements and availability of training and create a skilled and better informed workforce.

1.7 Rationale

1.7.1 **Organizations world wide are adding e to their learning**: The Government of India, in recent years, has started laying emphasis on modern ICT tools for imparting training to employees. Several organizations, world over, including some railways e.g. those in Canada, USA and UK are using computer based training (CBT) for large scale deployment, through a variety of media including CD-ROM, LAN (Local Area Network) WAN (Wide Area Network), companywide intranet and the internet. The Indian Railways are, however, using computer based training in a very limited way in the Zonal Training Schools (ZTCs), primarily for training drivers and some categories of staff of the Transportation and Commercial departments. Some safety related training modules are covered by CBT.

1.7.2 **ICT has revolutionized the Indian Railway's business, now it must revolutionize learning:** Indian Railways adopted ICT in a big way for the Passenger Reservation System (PRS), which has been an unparalleled success, in the signaling and telecom system, freight operations and in several other areas. ICTs revolutionized the working of the Railways in these areas. It is time for the Railways to leverage the latest ICT technologies to transform the organisation into a vibrant learning organisation. This will be achieved only when

an organizational and holistic view of new models of training delivery is taken aimed at:

- Improving the ICT skill sets

- Bridging the gap between requirements and availability of training and

- Introducing flexibility in the pedagogy.

1.8 Significance of the study

1.8.1 **"Open up the doors – to as many people who care to gain access to it at whatever moments in their lives, however frequently they choose to knock upon this or that learning door – e learning."** This was the theme of the National Seminar on ELECTECH India 2005 organised by Centre for Development of Advanced Computing (C-DAC), Hyderabad and it succinctly summarises the significance of e learning.

1.8.2 **Transformation of human resources through e learning**: The need for knowledge and skills development as well as attitudinal changes particularly in the Government sectors is increasing day by day. Traditional training methods would be insufficient to handle growing demands to train more people in more areas. E learning can provide additional training capacity. However, its real significance is in bringing about transformation if it can be implemented on the Indian Railways..

1.8.3 **E-learning viability for universal application in Railways:** This study is a starting point towards examining the feasibility of adopting ICT for large scale application of Computer based training in the organization and to explore whether e learning is a viable option for the Indian Railways. It provides a basis for further exploration in the areas of systems study, design, development and implementation of e learning and new pedagogy for the same.

1.9   Research Questions:

i.   What is the experience in regard to using computer based training by large, geographically dispersed organisations ?

ii.   Can CBT be used for training staff with low levels of education and computer literacy?

iii.   Is it a cost effective method?

iv.   What are the factors critical to the success of CBT?

v.   What could be the other positive externalities?

1.10   Methodology

1.10.1 **An exploratory work**: This is an exploratory project which started with a case study of the implementation of Computer based training on the Czech Railways, which had problems akin to that of the Indian Railways. This led to the exploration of CBT or E learning (as such learning is now more commonly

referred to) projects that have been implemented on a large scale in other large geographically dispersed organizations- What were the motivators, the models, the strategies, the outcomes etc.

1.10.2 **Study of existing practices**: Manuals and instructions on training issued by the Ministry of Railways and training practices on the Railways were studied. The data available with the Railways in regard to training requirement and availability were also studied.

1.10.3 **Case Study based approach**: A thorough review of case studies, articles and other literature sourced through the internet/books was made, for perusal of cases, projects and initiatives taken, particularly by developing nations and also at the organizational level. A further review of literature was then undertaken to explore the scope, effectiveness and economics of implementation of e learning solutions.

1.10.4 **Unstructured interviews**: Based on the insights so gained, unstructured interviews were conducted with some stakeholders in the Indian Railways to gauge the feasibility of blended learning solutions in the Indian Railways on a large scale. Personal visits were made to some of the selected Railway establishments and interviews were also conducted with officers dealing with training per se and some staff of the Railways. The feed back received was critically examined.

1.10.5 **Foreign study inputs**: As a part of the APPPA Course, a foreign study tour was conducted to South Africa. This opportunity was utilized to interact with

the office als in the Government of South Africa who are part of the policy framing, content development and implementation initiative for Government employees of that country. The insights so gained helped in formulating views on how other developing countries are approaching e learning.

1.11 Scope of the work and limitations

1.11.1 **Scope of work**: The scope of this of this work was

- to understand the efficacy of new learning technologies, particularly e learning

- Analyse the experience of some large organizations about their adoption of e learning

- Facilitate the Indian Railways to take an enterprise level view of e learning for bridging the gap between damand and supply

1.11.2 **Limitations**: Although it was intended to collect the response from Railway employees and officers connected with the training institutes through a questionnaire as to their readiness to approach e learning, it was realized during discussions that there is lack of awareness and understanding of e learning. It is still regarded by many as something altogether too technical and too distant in the realm of development to be adopted by the Indian Railways. In view of this, it was realized that a questionnaire based approach is of limited use for this study. Hence recourse was made to unstructured interviews only. Further, in view of the

limitations of time and resources, it was not possible to carry out empirical studies for evaluation or verification of the benefits of e learning and arrive at any scientific findings. This work was, therefore, limited to establishing only a broad framework, for being a starting point in the development of a full-scale computer supported learning and training system.