Network Deployment for Social Benefits in Developing Countries

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INTRODUCTION

For many reasons, the establishment of technology is crucial to **socio-economic development**, as well as increasing democratization of a nation. The technology is pervasive in nature, but the cost benefit together with the national urgency for its introduction through various applications mostly depends on the grass roots awareness and utilization of computers (interconnected computers) for the common people. Hence, the transferability and applicability of e-applications (**e-learning**, e-commerce, e-governance, e-health, etc.) must assured to be applied at their consistent state and best obtained by the congenial atmosphere at all levels of the policy making.

The essential issues are that **developing countries**, faced with enormous social and economic pressures, must start to confirm consistent economic growth and at the same time accelerate broad-based technology deployment. In this aspect, low-ranking developing countries had to utilize every benefit of it in order to compete with others for a dominant share of the global ICT contribution. In order to realize this vision more efficiently and cost effectively, and to integrate increased human participation within the technology, governments must be proactive in prioritizing limited resources by appropriate planning: build the foundation for a rational expansion of the **ICT sector** into higher value-added services. In addition, the drive to transform countries into "knowledge-based" societies will necessitate intergovernmental, interagencies, intersocietal, as well as private sector cooperation, commitment, dedication, and partnership in the context of an overall framework for the logical development of the ICT sector.

The positioning of suitable foundations requires a comprehensive national strategic vision with elaborate plans. They should ensure seamless interlinkages among all sectors and meaningful participation of all citizens in meeting the challenges to transform the human capital through establishment of various e-applications. At the same time, pervasive education/skill development and the provision for **life long learning** has to be interlaced within all sectors. As the technology is ever renewing, especially in developing countries, the inadequacy of proper management structure and the scarcity of suitably trained managers deserve immediate attention. This article emphasizes broad-based utilization of ICT applications for social developments, focuses on issues and challenges of their implementations with various usages, and provides a brief discussion on a few cases on networked applications.

BACKGROUND

Development and operation of network services to be utilized for social engagement call for system-oriented solutions, by far exceeding traditional network, databank, and software technologies. They require dynamic stratification and efficient access as well as a flexible and accommodating application of a broad range of resources in the network (information, contents, methods, equipment, etc.) while maintaining a high standard of availability, consistency, security, and privacy. Those include process-oriented software systems, multimedia information systems, and scalable component architectures, as well as safe information and communication systems. Applications would vary from multimedia information and news services, electronic transactions with legally binding effect, cooperative workflow management in distributed organizations to information management for multimodal platform, and e-applications. All these applications aim at rendering information—as an economic product—technically manageable and affordable (Chen, Chen, & Kazman, 2006; Li, Browne, & Wetherbe, 2006; TUHH, 2001).

New and converging technologies have created the Information Age that is altering society and assimilating information, and at the same time, maneuvering

educational institutions through homogeneous knowledge distribution. The 1990s have seen the growth in the connectivity and software that was available to the education community. In the beginning of the 21st century, novel and more powerful technologies are emerging to pave their way into classrooms across nations. Traditional classrooms and conventional learning are being replaced significantly by online/off-line e-learning in many layers of education and research. Advances in telecommunications technologies have spurred access to the Internet, allowing learners and educators to communicate around the world via new ways of communication techniques and presenting information in more powerful ways to analyze and understand the world around them.

Despite the rhetoric on the importance and use of information technology in the pedagogy, the changes in technology present many challenges to the higher education community, particularly in the area of financing their operations. Furthermore, there is a growing demand to integrate information technology not only into the educational curriculum and administration of higher education institutions, but also in educational pedagogy of the common masses.

Following the development trends, habits of users are also changing dramatically along with technology development. In 1996, 100 million text-based personal e-mail messages were sent worldwide in one day, while in 1998 it was 500 million. In 2002, about 30% of U.S. online households actively used rich media to communicate and, in 2004, video e-mail replaced text messages as the dominant online communication format. By 2005, text-based e-mails seemed as archaic as black-and-white TV, and about 92% of online users were communicating with rich media.[11] All these e-applications are changing the life style of the networked communities and at the same time improving the social status of the networked citizens.

MAIN FOCUS

This section discusses a few issues and challenges of implementation of technologies for social benefits. Later on, it focuses on several usages of their benefits and concludes with a few success cases.

ISSUES AND CHALLENGES OF ICT IMPLEMENTATIONS

The world is undergoing an indispensable transformation: from an industrial society to the information society. Information society technologies increasingly inculcate all socioeconomic activities and are accelerating the globalization of economies and knowledge (EU, 2006). However, the shift to the information society gives new challenges for learning and knowledge development. In a society where information is becoming a strategic raw material and knowledge an elementary production factor, how this resource is used becomes critical for the performance potential of the society. In this context, the innovative information and communication media provide the necessary technology to make knowledge available globally and create an unprecedented abundance of data, content, and information (Paraskakis, 2005; Walsh, 2002).

At the same time, technologies reinforcing the development of information society are in dynamic progression. Advances in information processing and communications are opening up new dimensions. There is a rigid shift from stand-alone systems to networked information and processes, thereby resulting in the convergence of information processing, communications, and media. However, the increasing diversity and complexity of systems is presenting further challenges in their development and usage (EU, 2006).

The Internet is providing interconnection of various networks supporting multilayered protocols, and information super-highways and gateway networks are becoming the pillars of global information infrastructure supporting universalization of services (Subramanian, 2005). But, maintenance of global Internet and its protocols are facing challenges in terms of developing content, especially while they are being utilized for human development. There are not many applications available right now to complement their development.

Among others, there are challenges to create sustainable public-private partnerships in the developing world. These include colocating telecommunication resources, sharing bandwidth, and creating sponsorships for public access telecenters and technical training academies (RTI International, 2006), much of which involve significant subsidies in their establishment, operation, and maintenance.

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