Preface

The benefits of development paradigms have not reached the people living in remote locations in rural areas in terms of socio-economic development, education and health opportunities which are easily available to people living in urban areas. Community-based development in rural areas provides access to services such as education, health, welfare, and agricultural extensions, facilitating opportunities for the rural population, while still retaining their social, economic, and cultural identities. Information Technology also can provide solutions to reduce problems of rural areas in terms of socio-economic development, education, and empowerment and raise the standard of living conditions. Access to and use of information and communication technologies (ICTs) have become essential for rural communities to attract and retain businesses, enhance educational opportunities and hence remain economically viable in the context of existing and next generation development paradigms.

ICTs have the capability to provide - static and dynamic gainsfrom increase in operating efficiency and from reduced transaction costs. In both cases, the channel for gains is through effective and lower cost information storage, processing and communication. Dynamic gains come from higher growth, potentially raising the entire future streams of consumption.

While technology has had a considerable impact on humanity's progress, it can also fuel inequality and tension. Considerable opportunities exist for investigating the link between ICT design and individual and social development. The digital divide is not only a matter of concern between developing and developed countries, but it is present within developing countries as well. This divide exists between rural and urban dwellers, or within areas of rural dwellers. Various research outcomes show that many rural regions still lag in comparison with urban areas in development and application of ICTs. The opportunities offered by information and communication technologies—telephone, radio, video, Internet—are unevenly distributed. The worldwide surveys indicate that barely six percent of the world's population is linked to the Internet, and many people on the earth have never made a mobile call. There is a growing disparity between information access haves and have nots, and most of them live in rural areas. This has created inequality in terms of employment and other socio-economic opportunities related to new information-based economy.

ICTs can play a major role in reducing the digital divide, which is creating a significant impact in terms of human development parameters. The lower-priced ICT devices, the development of low-cost mobiles, cloud computing, and breakthroughs in wireless access can help bridge digital divide. Digital-based educational tools are facilitating promotion of need-based training programs in rural areas as well as other remote locations. There is a huge demand for broadband access in rural and remote areas in all over the world. Rural communities are eager to be connected to emerging broadband networks so that they should not suffer the same economic fate as many communities that were bypassed by the telephone, the railroad, or the interstate highway systems.

WHERE THE BOOK STANDS

ICTs for Advancing Rural Communities and Human Development: Addressing the Digital Divide reviews the important impact ICTs have on economic, social, and political development and provides analyses of ICTs for education, commerce, and governance. This reference develops strategies and promotes awareness of human development initiatives as they relate to technology development and design.

Organization of the book

The book has been divided into seventeen chapters. The brief coverage of each chapter is given below.

Social networks have attracted individual interests to use ICTs for personal communication for social links in work schedules. This has created an imbalance between their personal and professional life. Chapter 1 examines how the hedonic use of electronic communications influences work life balance and cognitive absorption. Data collected through various research instruments from white-collar employees in the United States show that work-life balance mediates the relationship between personal e-mail and cognitive absorption, and that personal instant messaging has no impact on work-life balance but has a direct influence on employees' cognitive absorption. The findings suggest that work-life balance may eventually increase cognitive absorption and reduce employees' productivity. The findings provide insight into how different types of personal communication can influence work-life balance as well as into how to manage non-work-related electronic communications in the workplace. The recommendations given by the author are expected to ease tension between personal and work life balances.

The advancement and use of ICTs has made a significant impact on labor productivity growth and quality of life in developed countries especially in urban areas. Chapter 2 compares the effects of ICT on labor productivity growth and human quality of life in industrialized countries. A mathematical evaluation method based on the concept of Pareto-optimal organization is proposed for this study. This method is easy to apply and uses a linear programming model. The weights for various measurements are determined by objective method and are standard. The method is illustrated with real data from 23 developed countries worldwide.

Use of SMS for mobile communications has been increased worldwide in the recent years, yet language interpretation and translation in SMSs remains a challenge. Chapter 3 emphasizes that in any form of communication it is vital that both parties can understand the same language, if they cannot a translator is required. Currently mobile users engage the service of a third party provider to translate an SMS text into a different language. The existing services have a number of drawbacks (e.g. high cost to the user, not user friendly, they reduce the message space, and are inefficient). To communicate with a foreign person the sender must know the recipients preferred language and device display capability. What is needed is a service where a sender can send message in their native language without regard for the target tongue. The authors demonstrated that a mobile operator can provide a transparent service where the text message is automatically converted to the recipients preferred language. In comparison to the existing system, the implementation process suggested is efficient and cost effective and has large implications for commerce, language learning and person-to-person communication. A large number of services such as health care management, education, emergency notification, news, weather, and traffic reports and commerce applications can be delivered to vast mobile populations who are not able to enjoy the benefit of these services due to language barriers.

Kknowledge-based development initiatives have become important facets for the economic and social development. Chapter 4 illustrates Botswana's vision 2016, which is a set of strategic plans desired to position this country at the completive edge of the socio-economic hierarchy in Africa, which is being implemented with concerted efforts from both the private and the public sector, including ordinary citizens. One of the major motivations for drawing this strategy has been the desire to transform Botswana from a resource and industry-based (e.g. agriculture and diamond mining) to knowledge-based economy. This has come from the realization that in order to compete favorably at a global scale, there is need to put in place efficient knowledge value chains. To this course, several initiatives have been devised and/or implemented by both the government and the public sector. The author has made survey of the fundamental concepts on which this paradigm shift is hinged and brings out the different issues, initiatives and policies (such as Information and Communications Technology development, nurturing of an appropriate human resource base by way of strategic human resource development plans, investment in intellectual capital, etc.) that have been done so far in Botswana. The chapter, however, does not claim that it offers a compendium of existing programs towards a knowledge based economy initiated by Botswana

GIS has been given emphasis all over the world to help facilitate children in their educational and training interventions. The authors of Chapter 5 have developed "Children's Maps in GIS", a method for children's participation in spatial planning. Their studies show that 10-15 year-olds are capable of reading maps and using a GIS-application for communicating their interests in a stable and useful manner. The chapter examines the characteristics and discusses the first stages of implementation in a real world project, in relation to ICT. The authors report experiences from a Swedish municipality using Children's Maps in GIS in a survey with over 600 children as part of a comprehensive planning process and give examples of how data can be visualized. A significant digital divide between different parts of the administration is noted. In the ongoing development into an Internet version of the method the authors aim to increase the access to the GIS-application and develop standard procedures for categorizing and analyzing data.

Case management systems were designed to open the way for increased participation of young people and their families in child welfare interventions, and, their standardized format provides a valuable opportunity to use ICTs in social work practice. Existing research is unclear about how effectively case management affects participation, nor, the impact of ICT on social work interventions. Chapter 6 explores the findings of a qualitative research project that asked service users about their experiences of case management and how ICT could further their involvement in critical decisions for families. Service providers are keen to use ICT and this could help overcome the limitations of paper-based case management systems and exploit the communication potential of the internet and mobile phones. However, before ICT could be used, the complex 'digital divide' affecting disadvantaged families would need to be addressed and social workers' understanding and current use of ICT would need to be explored.

Information and Communication Technologies (ICT) offer a promising technology for citizens with disabilities to participate in local e-governance planning and implementation. Chapter 7 conducted a thorough literature review on existing research that suggests that for citizens with disabilities gateway issues such as technology access, usability, community- and government-receptivity are barriers to participation in local e-governance. A pilot study conducted by the authors indicates that the e-governance landscape for people with disabilities is heterogeneous, likely reflecting both differences within the disability community as well as among the online governance entities. Systematic changes to the development, implementation, and evaluation of local e-governance for people with disabilities are recommended, informed by an analytical model suitable for empirical testing.

Some of the municipalities of developed and developing countries have installed Wi-Fi systems to enhance Internet penetration for their local development initiatives. Chapter 8 illustrates that one of the typical design objectives of municipal Wi-Fi systems is the free or low-cost provision of connectivity for citizens, including people with disabilities and others impacted by the digital divide. The authors examine a range of municipal Wi-Fi implementation models for potential impact on e-accessibility. A comparative analysis was undertaken of sample U.S. and European municipal Wi-Fi systems to assess the business model and stakeholders involved in municipal wireless initiatives and to examine the degree of accessibility to or sensitivity of, municipal wireless systems for people with disabilities. As many people with disabilities are currently affected by social disparities in education and income, further marginalization of their communication and information access creates additional access barriers to critical information and full participation in community life.

Rural youth are the best target for ICTs penetration for rural development initiatives. In the last few decades, within the rhetoric of the "information age", there is a growing enthusiasm for the (potential) benefits of the dissemination of ICTs. This is further enhanced through eGovernment projects undertaken on a worldwide scale. However, a number of issues seem to defy such optimism as far as rural areas are concerned. Chapter 9 critically reviews such issues indicates ICTs undoubtedly benefit (human) development. In particular, drawing on data from a large-scale survey in Greece, identifies the marginal effects of a series of demographic, socioeconomic and spatial characteristics, and information sources on PC and Internet use on the part of young rural inhabitants, especially farmers. The results, pointing toward an emerging intra-rural digital divide, are consequently discussed vis-à-vis eGovernment projects, from the point of view of human development.

The multiagency development cooperation has become essential for coordination activities among various stakeholders. Chapter 10 draws upon the study of the Landscape Mosaics Project which is a global research project coordinated by the Center for International Forestry Research (CIFOR) and the World Agroforestry Centre (ICRAF) and funded by the Swiss Agency for Development Cooperation (SDC). The project examines biodiversity in tropical, forested, multifunctional landscapes in sites adjacent to protected areas. A key thematic component of its research examines the governance of landscapes, and by using a Participatory Action Research approach, the project aspires to facilitate better landscape governance through improved communication between village and landscape level actors. This chapter examines the initial experiences of the project in its Northern Lao site, located in Vieng Kham District, Luang Prabang Province. It describes as how the lack of access to information communication technologies have inhibited local actors' levels of participation in landscape level governance as well as affected their abilities to effectively and adaptively manage their landscape. Community radio, which provides local actors with the relevant information for more substantially participating in landscape governance as well as information useful for adaptive management, is proposed as one potential solution for improving participatory landscape governance.

Participatory radio, video and other ICT initiatives have helped to bridge digital divide and enhance nation building efforts. Using the case study of the Tlowitsis, a dispersed indigenous community in British Columbia, Canada, Chapter 11 explores the role of ICTs, and in particular participatory video, in nation building. It identifies factors that affect both the involvement and exclusion of the membership and addresses the challenges faced and lessons learned. ICTs, in particular new media technologies, offer great potential to overcome the geographic barriers caused by dispersal. However, it remains uncertain how they might contribute to the process of nation building. In this regard, the authors present six fun-

damental requirements for nation building, and then use these requirements to structure an analysis of the Tlowitsis case study.

ICTs have made a significant contribution to bridge the educational opportunities available to urban and rural areas using distance education modes. Chapter 12 explores the Chinese higher education system which is the largest in the world, but distance education, using ICTs, started later than in developed countries. It examines the benefits of education to human development and provides an overview of the recent development of distance higher education in China. The potential for further developing distance higher education with ICTs is considered. In addition, challenges are discussed and recommendations are made to improve Chinese distance higher education.

In developing countries the advancement and penetration of elementary education for human development has become important policy initiatives. Advanced ICTs tools can facilitate penetration of education in remote locations where infrastructure support is the limiting factor. Chapter 13 uses a mixed methods study, including a survey and follow up interviews, to investigate the concerns that elementary educators of concerns: the philosophy and pedagogy of ICT integration; accessibility of ICT (including software, hardware and resource personnel); infrastructure technical support; and educational integration of ICT in their teaching. Based on the research findings, the authors propose in a school district in British Columbia have regarding the diffusion and integration of Information and Communication Technologies (ICT) in their teaching. The research participants identified four major categories appropriate intervention methods to address these concerns, including targeted professional development, technical and educational support, and sustained access to proper ICT equipment.

The concern of digital divide in education and professional development has emerged over a period of time with the proliferation of information technologies. It has become essential to examine the impact of digital divide in education. Chapter 14 analyzes the experiences of six Master of Education (M.Ed.) pre-service teachers learning to integrate ICTs into their practice. These case studies demonstrate how novice teachers' learning processes can be impacted by the unequal distribution of the temporal, material, mental, social, and cultural resources available. A number of pedagogical and curricular recommendations for the M.Ed. program are then provided.

Assessment for learning (AFL) is a highly effective strategy for promoting student learning, development and achievement in higher education. However, since AFL relies on continuous monitoring of student progress through instructor feedback, peer collaboration, and student self-assessment, enacting AFL within large-group learning formats is challenging. Chapter 15 considers how technology can be leveraged to promote AFL in higher education. Drawing on data from students and instructors and recommendations from an external instructional design consultant, this chapter documents the process of pairing technology and AFL within a large-group pre-service teacher education course at one Canadian institution. Recommendations for the improvement of the web-based component of the course are highlighted to provide practical suggestions for instructors to evaluate their own web-based platforms and improve their use of technology in support of AFL. The chapter concludes with a discussion of areas for continued research related to the effectiveness of this pairing between assessment theory and technology.

Until now, research on podcasting in education mostly examined teacher created podcasts in K-12 and higher education. Chapter 16 explores podcasts in professional learning across several genres of podcasts. Using a popular typology of podcasts, teacher created, student created and professional development podcasts, this chapter compares contrasts and reveals the potential of multiple educational contexts and instructional strategies, formative instructional design, interdisciplinary strategies, formal and informal learning, and effective uses of data gathering methods. The significance of the study extends from not

only the extensive reach of the data gathering and production, but also the robust research model, formative and dynamic instructional design for staff development and recommendations for podcasting research strategies.

Improving and enhancing education is a goal for higher learning institutions that seek to provide better learning techniques, technologies, and educators and to generate knowledgeable students to fulfill the needs of industry. A field in need of significant improvement is engineering. One approach is to review the delivery and pedagogies used in the current educational system. Chapter 17 examines the problems faced by staff and students in the field of mechanical engineering. In addition, the authors explore new technologies that enhance and promote the learning process.

CONCLUSION

Information and Communication Technologies (ICTs) are enhancing efficiency and contributing to socio-economic development for people living in rural and remotely accessible areas. By addressing the digital divide and reducing the inequality, significant growth can be achieved for human development. There is a need to make concreted efforts to ensure that everyone has a chance to share in the benefits of ICTs. It is also essential to encourage international agencies to collaborate more on ICT issues for rural development and to increase parity between privileged and less privileged people. The efforts of various research initiatives and outcomes highlighted in this book have suggested some of the useful and relevant strategies which are expected to promote awareness of human development initiatives as they relate to technology development and design.

Susheel Chhabra
Lal Bahadur Shastri Institute of Management, India