Preface

The expectation of individuals and groups for accelerated development in the shortest possible period has been increased in this virtual environment. Information Communication Technologies (ICTs) are playing a vital role in enhancing interaction, collaboration, and hence, human development.

The development paradigm of human beings is widespread and multiple fields are creating a positive impact for accelerated growth. ICT is one of the most powerful forces that have influenced human development in all walks of life. Bridging the gap between rich and poor and equitable distribution of resources is one of the greatest challenges our society is facing today.

ICT can help to bridge this gap by facilitating the creation of process-oriented architectures for the equitable distribution and sharing of resources. The increasing use and pervasive impact of ICT can substantially enhance the ability of developing countries to address the full range of development goals. ICT can be a powerful enabler of development initiatives targeting specific development goals contributing to the critical mass and the threshold levels needed to ignite a virtuous cycle of development. It can influence the level of development by adoption of multidimensional approach, achieving coordinated actions, interactions and local implementation, and facilitating national and international linkages.

ICT driven interaction and collaboration in this virtual environment has shortened the gap, and people have come together to share their energies for the overall benefit of society. Interaction and communication has proven to be central to the concept of human development, and it is the single-most important factor to the success or failure of our efforts. The enhanced attention has been given to this dimension since today’s multi-dimensional structures are based on ICT mediated communication. It has been estimated that 65% of the population in advanced countries is engaged in creating and processing information.

The availability of ICT infrastructure is not adequate to facilitate interaction and collaboration. The awareness and creation of public access points plays important role in use of ICT resources. Numerous research studies have been taken on this dimension; the major facts discovered are the convenience and use of these access points by the users. The creation of trust in a virtual environment, as well as development of search engines and advanced networks, is an important aspect which is influencing the wide-spread use of ICT for human development. The community participation in sharing and use of natural resources as well as health-related information has also been found to be successful in this technology-based society.
WHERE THE BOOK STANDS

*ICT Influences on Human Development, Interaction, and Collaboration* creates awareness on how ICTs contribute to human development in multiple areas. It describes the link between ICTs and human development, which includes economic, social, and political development. It identifies potential applications for the development of human beings and provides insightful analysis about those factors (also contextual and institutional ones) that affect ICTs for human development initiatives. This book addresses future challenges by proposing strategies to both governments and international cooperation organizations for moving forward.

ORGANIZATION OF THE BOOK

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

Public access to ICTs in less privileged areas has been important keeping in view their impact on daily lives. Libraries, telecenters, and cybercafés offer opportunities for wider public access to Information and Communication Technologies (ICT). Chapter 1 presents findings of a global exploratory study on the landscape public access venues in 25 countries around the world in a global study. The research uses profiles of the users of the different types of venues with respect to age, income, education, and gender. Results highlight the importance of strengthening public access venues in non-urban settings and to strengthen programs that reach out to underserved populations. The research also points to challenges faced by libraries and telecenters given the immense growth of cybercafés as public access venues.

Trust has become a central issue for enhancement of e-commerce interactions in this virtual environment. The virtual environment of B2B e-commerce interactions has been considered a barrier in building trust of trading partners. Chapter 2, through empirical evidence, supports the relationship between various trust-related technology issues, such as security, privacy, authentication, etc. However, there is a dearth of evidence confirming the causal relationship between environmentally related trust issues, such as social-cultural characteristics, technology standards, and regulatory framework. Based on a survey of 106 Indian companies using inter-organizational systems, this research makes an attempt to identify specific attributes of these three environmentally-related issues that have the potential to influence trust in B2B e-commerce.

Personal Communication Service (PCS) networks aim to provide “anytime-anywhere” cellular services which enable Mobile Terminals (MTs) to communicate regardless of their locations. However, in order to guarantee a successful service delivery, MTs’ real-time location should be continuously managed by the network. Location management plays the central role in providing ubiquitous network communications services, which includes two fundamental processes, i.e., registration and paging. Registration is concerned with reporting of the current locations of the MTs, while paging is used to locate the MT. Both processes incur signaling cost, and due to the scarcity of PCS wireless bandwidth and for more scalable mobile services, it is important to reduce that signaling cost. The blanket paging in current PCS networks wastes a lot of wireless bandwidth. Chapter 3 focuses on the subject of paging in an attempt to reduce the paging signaling cost under delay bounds. The research challenges the signaling cost problem and successfully establishes a family of probability-based paging strategies. The chapter introduces a novel topology for the network registration area, which is called the Hot Spot Topology (HST) and
based on HST, a novel location management strategy, which is called “Flower Based Strategy” (FBS) is also introduced.

There is a need to strengthen e-business interactions in agribusiness. Chapter 4 explores the e-readiness of firms in the Australian horticulture supply chain. It uses Perceived E-Readiness Model (PERM) and relies on data collected from a survey of firms in the horticulture sector in Australia. The results indicate that while horticulture firms demonstrate relative organizational preparation for the conduct of e-business, the value network within which they operate does not appear to encourage and support their endeavor. In particular, government and industry associations do not appear to play supportive roles in encouraging the use of e-business among members of the horticulture supply chain. This chapter highlights factors that are likely to facilitate or inhibit e-business in agribusiness, an area lacking in research globally. Practitioners such as governments, horticulture associations, growers and growers’ associations, and digital marketplace operators, through understanding the e-readiness factors affecting e-business, can make effective decisions to develop their support, capabilities, and offerings, respectively.

Community development through public access to ICT is becoming popular in this virtual environment. Chapter 5, through a comprehensive research study, considered public libraries, telecenters, and cybercafés, and grouped the findings into four types of success factors: (1) understand and take care of local needs first, (2) train info mediaries and users, (3) build alliances with other venues and collaborate with other community services, and (4) strengthen sustainability. The findings highlight critical variables to be considered in policy decisions, funding allocations, and program implementation to reach underserved populations in developing countries with equitable access and meaningful use of ICT. They also provide valuable direction that can contribute to community development through public access to ICT.

Search engines have become part and parcel of communication and interaction. ICT plays a vital role in human development through information extraction and includes computer networks and telecommunication networks. One of the important modules of ICT is computer networks, which are the backbone of the World Wide Web (WWW). Search engines are computer programs that browse and extract information from the WWW in a systematic and automatic manner. Chapter 6 examines the three main components of search engines: Extractor, a Web crawler which starts with a URL; Analyzer, an indexer that processes words on the Web page and stores the resulting index in a database; and Interface Generator, a query handler that understands the need and preferences of the user. It concentrates on the information available on the surface Web through general Web pages and the hidden information behind the query interface, called deep Web. Emphasis has been placed on the extraction of relevant information to generate the preferred content for the user as the first result of his or her search query. It also discusses the aspect of deep Web with analysis of a few existing deep Web search engines.

Health information systems are facilitating medical practitioners to control diseases. In malaria control, ICTs can ease communication, improve doctors’ training, and increase access to information by individuals and groups that are historically unaware of malaria. Successful malaria vector control depends on understanding causes, prevention, and treatment. Chapter 7 examines the possibilities of using ICTs to eradicate malaria in Tanzania. It also explores the coverage of the malaria subject related to Tanzania on various electronic databases and e-journals. It concludes that Tanzania’s Ministry of Health must put forth more effort on ICT management and be more active in their approach of disseminating malaria information.

e-Environment has become major factor in gaining market share for businesses. Chapter 8 provides a deep understanding of the current status of electronic networks in the Jordanian handicrafts sector from managers’ perspectives. More specifically, the study enhances utilization of the e-environment to gain
market share in local, regional, and international markets. Four cases of handicraft projects are selected to conduct face-to-face interviews. The results show that handicraft projects have initial attempts to use e-electronic in their activities, but these attempts are still in embryonic stages, and they do not use e-networks effectively to gain market share. However, project managers believe that there is a direct link between the use of electronic networks and increases in the business’s market share. Furthermore, it is intended that these initiatives be treated as innovative and at the end be utilized to enhance the business development of similar enterprises belonging to the small and medium enterprises sector. The study recommends that such projects consider adoption of e-networks in their future plans, enhance their staff skills in terms of improving their IT and English language skills, and develop their own internet website to create new marketing channels.

Rural Production Company, henceforth RPC, was set up in 2007 by a university-based technology and business incubator employing an ICT-mediated distributed production model. Chapter 9 reveals how RPC, initially an exploratory project whose key innovation was its Internet kiosk-facilitated model of crafts production and local empowerment, morphed into a social enterprise catering to global demands. The context of innovation provided by the Incubator led to a transformation of an ICT4D (ICT for Development) project into a business venture through the practice of formal and informal questioning at every stage of its implementation. It focuses on the iterative method adopted while highlighting the role of the incubator in the overall design and development process of the enterprise. It is a reflexive mapping of the organization’s evolution from the original research agenda of outsourcing production cum rural employment, to one that privileges local networks both as a conscious business strategy and as an arena for collaborative change for human development.

Use of ICTs in Small and Medium Enterprises has become essential to bridge the digital divide. Internet use has grown and spread rapidly around the world during the last decade. Today, computers and the Internet have become an integral part of modern societies. The Internet has created a new medium for communication and commerce for businesses. It is hard to imagine a business working without using a computer. These technological advances have also largely affected Small and Medium-Sized Enterprises (SMEs). While large companies have been quick to adopt the Information and Communication Technologies (ICTs), SMEs have been slow to adopt these technologies for various reasons, especially in developing countries. Chapter 10 explores the factors affecting the adoption of e-commerce by small businesses in a developing country. To attain this purpose, a case study was conducted in a small hotel, which is using its website to keep up with customer expectations and competition in a small Turkish city. Conclusions and suggestions derived from this study provide a meaningful contribution to the understanding of e-commerce adoption among small businesses in developing countries.

Adoption of innovation strategies in entrepreneurship is an age-old phenomenon, but inclusion of open innovation or collaborative innovation strategies in the business processes is a newly evolved concept. By far, most research reveals that the majority of successful global ventures are adopting open innovation strategies in their business proceedings. However, despite their contribution to entrepreneurship and national economy, the Small and Medium-Scale Enterprises (SMEs) are well below the expectation level in terms of acquiring this newly emerged trend of doing business. Moreover, not much research is being conducted to investigate SMEs potencies, expectations, delivery channels, and intricacies around the adoption, nourishment, and dissemination of open innovation strategies. Chapter 11, through research, proposes a contextual framework leading to an operational framework to explore the lifecycle of open innovation strategy management activities focusing technology transfer (inbounds or outwards). It discusses a few issues on future research in empowering SMEs through utilization of open innovation strategies.
In the past year, knowledge and innovation management have acquired increasing relevance in organizations. In the last decade, open innovation strategy, and in particular, crowdsourcing innovation model, has also gained increasing importance. This model is seen as a new innovation model, capable of accelerating the innovation process. Therefore, it is important to understand how organizations can best take advantage of this innovation model. Chapter 12 approaches in two ways for commercializing intellectual property: crowdsourcing innovation and intellectual property marketplaces. Thus, with the intention of understanding the concepts and practices, the study started by collecting scientific articles through bibliographic databases. It provides knowledge about concepts and practices underlying the ways for commercializing intellectual property. It also contributes with a proposal of architecture for an intellectual property marketplace, based on the analysis of practices about crowdsourcing innovation and intellectual property marketplaces. This architecture is still in a draft stage, but already includes helpful insights for organizations interested in applying the open innovation strategy.

The acceptance and use of ICT plays an important role in the enhancement of value to individuals and groups. Chapter 13, through a research study, examines the acceptance and use of ICT by Nigerian university academicians. The model validated is the Unified Theory of Acceptance and Use of Technology (UTAUT). Using a pilot study, one hundred questionnaires were administered and collected at the University of Jos Plateau State, Nigeria. The construct was significantly correlated with Behavioral Intention (BI). This implies that the university ICT system makes tasks easier to accomplish, thereby making academicians more productive. The survey shows that 86.5% agree. Effort Expectancy (EE) was significantly correlated with BI. The result shows that 84.3% agreed that they could use ICT. Among the four UTAUT constructs, performance expectancy exerted the strongest effect. The UTAUT model shows age effects for older workers and a stronger willingness for the younger workers to adopt new IT products. According to this study, age and gender do not have significant effect on acceptance and use of ICT. Performance Expectancy (PE) and Effort Expectancy (EE) are found to be the most significant predictors of academic staffs’ acceptance of ICT and use.

The leapfrogging theory claims that instead of following the conventional digital trajectory set by the West, emerging regions can straightaway use cutting-edge technology to “leapfrog” the digital-divide. To explore the possibility of digital leapfrogging by an emerging region, chapter 14 looks at the three domains of hardware, software, and connectivity. In each domain, the default technology and its potential is evaluated as a digital inclusion tool, while being juxtaposed with the latest “cutting-edge” alternative that could be used instead for “leapfrogging.” Three specific scenarios are developed in telephony, banking, and the World Wide Web, which illustrate how a combination of these different technologies helps emerging regions “leapfrog the digital divide.” Finally, the chapter suggests certain leapfrogging trajectories that ICT4D projects should explore.

There is increasing evidence that e-commerce adoption among SMEs is expanding rapidly. In spite of that, SMEs, particularly in developing countries, have not been able to adequately benefit from the new opportunities offered by e-commerce technologies. Previous studies have identified lack of trust as one of the major hurdles in achieving the potential benefits by the SMEs. Chapter 15 identifies technology-related trust issues that need to be addressed while building e-commerce infrastructure for SMEs. The evidence offered in the chapter is based on a survey of the relevant practices regarding deployment and effective implementation of relevant technology tools to address these issues and enhance the levels of trust in e-commerce infrastructure. It also examines the relationship between the perceived level of trust and the level of assurance in respect to various technology-related trust issues. Chapter 15 suggests an
approach of collaboration among the SMEs while building the e-commerce infrastructure and focusing attention on the technology-related trust issues.

The behavior of adolescents in developing countries put them at an increased risk for HIV and other STIs (Sexually Transmitted Infections). Additionally, their knowledge about HIV/AIDS is often inadequate. An ICT-based quasi experiment was designed to be conducted at four high schools with a random sampling of 451 students. Two high schools used computers and other multimedia methods to promote AIDS education, while two other schools used traditional lectures. Each school had two class-hours of AIDS education. Findings determined a gap in knowledge, attitude, and behavior about HIV/AIDS issues within these different groups. Chapter 16 provides implications for current teaching approaches in this study.

CONCLUSION

Information and Communication Technologies (ICTs) are making a significant impact on human development, interaction, and collaboration among individuals, groups, and societies. 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 in this domain. The important ICT dimensions that have made significant influence for human development, interaction, and collaboration are given.

ICT has made an important contribution in facilitating public access points for interaction among a less privileged section of society, which will help to bridge the level of development between various sections of society. The creation of trust in the virtual collaborative environment is essential for use of ICT resources for human development. The use of advanced security systems and Personal Computer Networks (PCN), along with search engines, has made a remarkable contribution in this area, which influences e-commerce in all facets of life. The impact of ICT interaction and collaboration in agribusiness and health information has made an important stride in human development. The users in these areas are making themselves e-ready to harness the opportunities of development.

e-Environment has become a major factor in gaining market share for small and medium businesses. SMEs should consider adoption of e-networks in their future plans, enhance their staff skills in terms of improving their IT and English language skills, and develop their own Internet website to create new marketing channels. This will help entrepreneurs to enhance their skills using innovative strategies for collaboration and achieve their goals.

The interaction and collaboration using ICT provides knowledge about concepts and practices underlying the ways for commercializing intellectual property. It also contributes with a proposal of architecture for an intellectual property marketplace, based on the analysis of practices about crowdsourcing innovation and intellectual property marketplaces. The convenience and direct use of ICTs for human development has facilitated the development of leapfrogging theory, which claims that instead of following the conventional digital trajectory set by the West, emerging regions can straightaway use cutting-edge technology to “leapfrog” the digital-divide.

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