



## **Chapter 2**

# **Electronic Architectures for Bridging the Global Digital Divide: A Comprehensive Assessment of E-Business Systems Designed to Reach the Global Poor**

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## **ABSTRACT**

This chapter presents a comparative view of e-business systems designed to extend the benefits of e-business to the poor demographic segments of the developing world and to reach populations that are on the “wrong side of the digital divide.” Four such systems are selected: the Global Trade Point Network (GTPN) of the United Nations, Alcatel Telemedicine Network, Little Intelligent Communities (LINCOS), and Johns Hopkins International’s (JHI) Telemedicine Network. The four networks are compared across various network architecture dimensions. Our analysis indicates that LINCOS offers reduced capital cost, flexible architectures, and at the same time access to worldwide information systems, and hence has the highest potential to reach effectively the most excluded population in developing countries. Collaborations among technology marketers, national governments

and international agencies are needed to identify the needs of the digitally excluded population and select appropriate architectures to serve the needs.

## INTRODUCTION

Used appropriately, the Internet may deliver higher value to the people in developing countries than those in developed countries (World Bank, 2000). Arnold and Quelch (1998), for instance, argue that firms and individuals from developing countries can benefit more by using the Internet as a distribution channel than those from developed countries:

[T]he power of new electronic media, notably the Internet, is not restricted to developed economies. Indeed, given the limits of conventional distribution channels in EMs [emerging markets], their value may be higher, albeit in only a small market. Worldwide electronic marketplaces allow local businesses access to a range of product choices and price quotes that can diminish the local distributors' often exclusive power. Industrial customers in particular are likely to find it economically attractive to establish electronic links with suppliers and customers outside their country. (p. 18)

There is, however, a wide gap between rich and poor nations in terms of their capabilities of accessing, delivering, and exchanging information in digital forms (Carter & Grieco, 2000). Developing countries, comprising more than 80% of the world population, account for a tiny fraction of global e-commerce. An estimate suggests that 99.9% of business-to-consumer e-commerce in 2003 will take place in the developed regions of North America, Europe, and Asia Pacific (Computer Economics, 2000). This "global digital divide" is the outcome of the complex interactions between information and communication technologies (ICT) and various factors in the environment.

If larger numbers of firms and individuals from developing countries are connected to the Internet, the utility value of the network will increase because of the well-known network externality effects (Katz and Shapiro, 1985, 1986). Apart from economic benefits such as more choices and the convenience of shopping at home, the Internet can facilitate progress on educational and scientific development, mutual aid, and world peace (Fink, 1997; Mansell & When, 1998). It can also foster democracy and offer exposure to and knowledge of other cultures (Fink, 1997). The benefits of widening and deepening of Internet access in the poorer countries thus not only accrue to the developing countries but also to the developed countries and the world as a whole.

The global digital disparity is attracting the attention of academicians and policymakers (Petrazzini & Kibati, 1999; UNDP, 2001). In recent years, several initiatives are being taken at different levels to exploit fully the potential of the Internet and e-commerce and to bridge the existing digital divide. Some of the initiatives are purely philanthropic; some are commercial, while others are a combination of the two. The extent to which individuals and organizations from developing countries will be able to enjoy the benefits of the Internet is a function of the characteristics of the network architectures designed to reach them. Several networks are emerging in an attempt to reach the global poor. The emerging networks that entail "*at least one of the activities – production, distribution, marketing, sale or delivery – of goods and services by electronic means*" fall in the domain of e-commerce (WTO, 1998). Little research exists on such emerging networks. This chapter aims to fill the research gap by providing a comparative assessment of the architecture of four of such networks – Global Trade Point Network (GTPN) of the United Nations, Little Intelligent Communities (LINCOS), Alcatel Telemedicine Network in Senegal (and proposed E-government Network in Mali), and

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