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The Information Superhighway: Key Elements Affecting its Development and a Framework for Analysis

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Introduction

A topic generating a great deal of interest, debate, and hype in industry and media today is that of the Information Superhighway. Few topics in recent history have created or attracted as much hype and attention as the claims and promises being made about the Information Superhighway. The 'Information Superhighway' is a phrase that has been used in recent times to describe an emerging ubiquitous medium of communications that will provide many new and exciting opportunities to create, market, deliver, and exploit new information and knowledge services. Recent literature indicates that the Information Superhighway will have a profound impact both on business as well as society in general (see for example Weingarten, 1994, Neumann, 1994, Reynolds, 1993, Gillette, 1994, Bolter, 1994, and Fields, 1994). It promises to create new electronic markets and virtual industry value chains or hierarchies, to radically reshape competitive landscapes, and drastically affect and revolutionize the very way we do business today (Zygmunt, 1994, Reynolds, 1993). Benjamin and Wigand (1995) illustrate how the future traffic on the Information Superhighway may potentially affect each segment of an industry value chain. It is claimed that the impact of the Information Superhighway in the areas of education, healthcare, information access, entertainment, telecommuting, on-line shopping, and others will be nothing short of profound (Weingarten, 1994, Graumann, 1994, Schnaidt, 1993). The Information Superhighway is also expected to affect business and society in some negative ways (see for example Schrage, 1994). Neumann (1994) has identified some major risks on the Information Superhighway. The regulatory and legislative policy issues related to the Information Superhighway have sparked some public policy debates and concerns. Simmons (1994) provides a brief discussion on vital policy issues as they relate to the Information Superhighway (also see Bolter, 1994 and Graumann, 1994 for a more detailed exposition on the topic.)

It is clear that the concept of the Information Superhighway has truly captured the attention of the media, industry, academia as well as the public in general. Inasmuch as

the hype and attention the Information Superhighway has received, the notion of the Information Superhighway has baffled both industry analysts as well as academic scholars. For example, a review of the recent literature related to the Information Superhighway (Bolter, 1994, Cronin, 1994, Fields, 1994, Baker, 1994, Gillette, 1994, Graumann, 1994, Shank, 1994, Reynolds, 1993, Simmons, 1994, Rayport and Sviokla, 1994, Thatch and Woodman, 1994, Tate, 1994, Rhodes et al, 1994, Weller, 1994, Bromfield et al, 1995, Benjamin and Wigand, 1995, and others) reveals a great deal of ambiguity, confusion and disagreement among industry experts as well as academic scholars. This confusion partly stems from speculation, incongruity, overlap and the multiplicity of the private and public sector definitions and visions of the Information Superhighway - for example, on the one hand a commonly held view is that the Information Superhighway is nothing more than a 'fantasy' (Shank, 1994, Thorell, 1994, Fields, 1994) while, on the other hand, some believe that the Information Superhighway already exists (Zygmunt, 1994, Cronin, 1994, Gleick, 1994). Part of such confusion can also be attributed to the inconsistency in the use of terms and descriptors for the Information Superhighway (for example, terms and descriptors such as the 'the Internet', 'the electronic society', 'cyberspace', 'hyperspace' and the 'NII or the National Information Infrastructure' and others are commonly utilized to describe the Information Superhighway). Benjamin and Wigand (1995) point out that despite the heightened focus of government, industry, and public advocacy groups, the direction the Information Superhighway will take as it moves toward a more generally shared vision is still unclear. Several papers, books, and symposia are currently devoted to debating what the Information Superhighway will ultimately look like. Thus it is clear that in spite of the enormous exposure given by the media and the government, the Information Superhighway is still an enigma to most people as well as organizations. It is apparent that the Information Superhighway has come to mean different things to different people.

This research is an attempt to clarify some of the aforementioned confusion. The objective of this study is three-fold: 1) to review current literature on the Information Superhighway and identify the major forces playing a key part in determining the future of the Information Superhighway; 2) to provide a conceptual framework that describes the Information Superhighway along with key value-creating and value-adding entities and their conceptualized associations; and 3) describe how the Information Superhighway will impact three major business issues -- business process redesign, business network redesign, and business scope redefinition.

A review of recent literature on the Information Superhighway is provided. Several elements have been instrumental in the development of the Information Superhighway or the NII as we see it today. We provide a discussion on the key elements, including the drivers, the enablers (push and pull factors), and the inhibitors, affecting the development of the Information Superhighway (see Table 1 for a high level summary). A way of realizing the big picture is through the use of frameworks and models. A conceptual framework for analyzing the Information Superhighway (see Figure 1 for a high level summary) is provided. We support this framework and its elements by providing examples (see Figure 2) from the existing World Wide Web Electronic Commerce Resources (Ho, 1994). Three major business issues critically affected by the Information

Superhighway are - Business Process Redesign, Business Network Redesign, and Business Scope Redefinition. A high level summary is provided in Figure 3.

Drivers	Push-Supply Factors	Pull-Demand Factors	Inhibitors
<ul style="list-style-type: none"> • Increased IT and Telecommunications capability • Globalization and Worldwide Competition • Shift from Manufacturing to Service and Information Economy • Virtualization 	<p><u>Technology</u></p> <ul style="list-style-type: none"> • Improved Performance/Price ratio • Convergence Trends • Key Technology Enablers <p><u>Supplier/Vendor Push</u></p> <ul style="list-style-type: none"> • Innovative Information Superhighway-based applications and business solutions <p><u>Political</u></p> <ul style="list-style-type: none"> • Government leadership 	<p><u>Business/Organizational</u></p> <ul style="list-style-type: none"> • Innovative Information Superhighway-enabled applications to obtain differential benefits in the marketplace • Demand for ubiquitous connectivity to maximize global economies of scale/scope while being fully responsive to local markets • Inter-enterprise cooperation and coordination <p><u>Political and Societal</u></p> <ul style="list-style-type: none"> • Potential increase in employment opportunities 	<p><u>Business and Organizational</u></p> <ul style="list-style-type: none"> • Lack of strategic vision • New investments • Operational inertia due to legacy infrastructure investments • Intellectual property right concerns, security • Uncertainty, risk and hype <p><u>Technology</u></p> <ul style="list-style-type: none"> • Lack of standards and Security <p><u>Societal</u></p> <ul style="list-style-type: none"> • Emergence of a Information Superhighway-based underclass • Psychological and other negative impacts of cyberspace work <p><u>Political/General</u></p> <ul style="list-style-type: none"> • Redefinition/relocation of knowledge jobs • Unresolved issues related to governance, regulation and maintenance, censorship <p><u>Economic</u></p>
			<ul style="list-style-type: none"> • infrastructure costs

Table 1. Key Elements Potentially Affecting the Development of the Information Superhighway

FIGURE 3

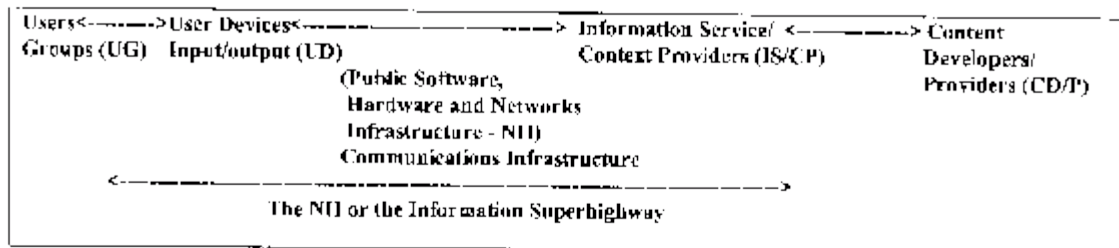


Figure 1. A Framework for Analysing the Information Superhighway

