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# Developing Information Systems for the New Economy

Panagiotis Karachristos

*National and Kapodistrian University of Athens, [pknet@hol.gr](mailto:pknet@hol.gr)*

Panagiotis Kanellis

*National and Kapodistrian University of Athens, [kanellis@di.uoa.gr](mailto:kanellis@di.uoa.gr)*

Dracoulis Martakos

*University of Athens, [martakos@di.uoa.gr](mailto:martakos@di.uoa.gr)*

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# Developing Information Systems for the New Economy

Panagiotis Karachristos, Department of Informatics, National and Kapodistrian University of Athens, [pknet@hol.gr](mailto:pknet@hol.gr)

Panagiotis Kanellis, Department of Informatics, National and Kapodistrian University of Athens, [kanellis@di.uoa.gr](mailto:kanellis@di.uoa.gr)

Drakoulis Martakos, Department of Informatics, National and Kapodistrian University of Athens, [martakos@di.uoa.gr](mailto:martakos@di.uoa.gr)

## Abstract

Although today the e-economy is just a small percentage of the world's economy, it is obvious that the Internet will be the way of doing business in the near future. New questions, related to the rise of electronic networks and the use of information, demand our attention. The treatment of information as a supporting element of the value adding process seems not to suffice in the new era, rendering obsolete the ways that organizations used to seek for competitive advantage. In the new economy, information systems are not merely the 'tools that support a process', but they are rather 'tools that create new value adding processes'. Research should focus on this parameter and establish whether or not the approaches of developing information systems in the new economy should be differentiated from those of the past.

## Introduction

Understanding that the aim of all organizations is to find the best way to operate and improve efficiency and effectiveness, Porter (1980) suggested the value chain model as the necessary tool to gain the competitive advantage through process analysis and improvement. For almost two decades his framework provided the rationale and guidance for the development of systems which treated information as a supporting element. However, the emergence of the Internet and the fundamental changes that has brought put information in the center of the business operations as a source of value itself.

This evolution has affected all aspects of business, creating new fields of operations and consequently new series of value adding activities between supply and demand. For example, in all sorts of markets, customers will soon be able to describe exactly what they want, and suppliers will be able to deliver the desired product or service without compromise or delay. The innovation that will catalyze this shift is what Slywotzky (2000) called the "choiceboard". Choiceboards will be interactive, on-line systems that allow individual customers to design their own products by choosing from a menu of attributes, components, prices, and delivery options. The role of the

customer in this system shifts from passive recipient to "active designer" (Slywotzky 2000).

The Internet is helping companies to lower costs dramatically across their supply and demand chains, to take their customer service into a different league, to enter new markets, to create additional revenue streams and to redefine their business relations. The implication of the above is what prompted Andy Grove, the chairman of Intel, to comment that in five year's time all companies will be Internet companies, or they won't be companies at all. (The Economist, June 26 1999).

As organizations are attempting to align their business models and operations around e-commerce initiatives, information systems play a central role as creators of the new value adding processes. As Neilson *et al.* (2000) maintain "...true e-businesses are redefining traditional value chains and developing complex knowledge-sharing systems that connect pricing, product and design information with suppliers and customers" (pp. 52). It is, we feel, that these discontinuities may have implications on the ways we were accustomed to developing and using information systems in the past. Our research aims primarily to understand the new commercial environments and the dimensions of the organizations operating within. This understanding will provide the basis for a critical examination and critique of well-established design and use principles, resulting in a roadmap for developing information systems in the new economy.

In the following section we point out the differences for competing in the new economy where information is the main source of value. Based on this we offer a discussion on the ability of Electronic Data Interchange (EDI) - a 'traditional' application, to mirror the new realities. The concluding section describes briefly our research approach at this point in time.

## Competing in the 'Marketspace'

Businesses today increasingly compete in two worlds: a physical world and a virtual world made of information. Rayport and Sviokla (1995) have referred to this new information world as the 'marketspace' to distinguish it

from the physical world of the ‘marketplace’. Marketplace is a virtual realm where products and services exist as digital information and can be delivered through information - based channels. The processes for creating value are not the same in the two worlds. In the physical world the processes involved are often referred to as links in the “value chain”, describing a series of value adding activities connecting a company’s supply side. By analyzing the stages of a value chain, managers have been able to redesign their internal and external processes to improve efficiency and effectiveness (Rayport and Sviokla, 1995). It is important to understand that the value chain model treats information as a supporting element of the value adding process, and not as a source of value itself. This is better illustrated through a consideration of the notion of ‘navigation’; what has been identified by Evans and Wurster (1999) as the battlefield on which competitive advantage will be won or lost in the new economy. The three dimensions of navigation are depicted in Figure 1. Reach refers to access and connection - how many customers a business can access or how many products it can offer. Affiliation is about whose interests the business represents. Richness is the depth and detail of the information that the business gives the customer or collects about the customer.

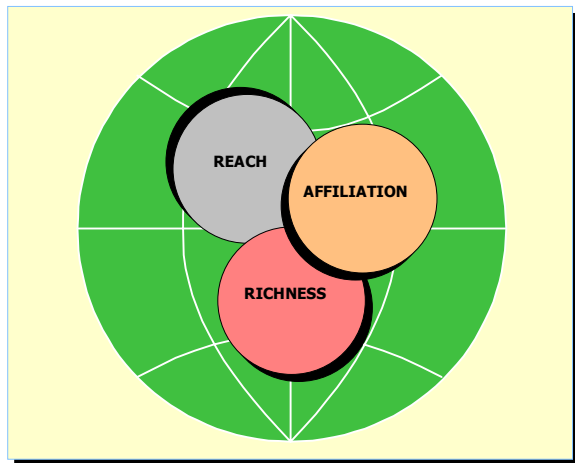


Figure 1: The three dimensions of navigation

In general, consumers rely on product suppliers and retailers to help them navigate among their choices. Those businesses, in turn, exploit the consumers’ search costs to build competitive advantage by creating navigational tools such as branding and advertising. Those are used by consumers to ‘short-circuit’ the complexities of a comprehensive search, and find the products they will eventually purchase. Ewans and Wurster (1999) correctly underline that in most consumer businesses, far more profitability could be derived from influencing navigation than from manufacturing or distributing the physical product itself.

On the Internet massive amounts of information could be exchanged directly, quickly, and for free. Consumers can search much more comprehensively and at negligible cost. Navigation and selection occur independently of physical warehousing and distribution, meaning that physical shopkeepers, who used to exert enormous influence over consumer choice, no longer enjoy any special advantage. Furthermore “pure” navigators like Yahoo can organize information, helping consumers to make better informed choices.

Shahlman (1999) argues that the combination of entrepreneurship and the Internet will at the end allow companies to achieve those efficient business models they were after as the new economy creates a system in which both businesses and their customers win. However, the importance of these shifts cannot be overemphasized. In the new economy the organizations must look and understand the marketplace in order to create value with information systems. If we are to accept reach, richness, and affiliation as the three dimensions that could determine competitive advantage in the same way as we have done in the past with Porter’s value chain model, several issues arise. The most fundamental is whether or not the ways we used to follow in thinking, planning, and developing systems to cater for the needs of the marketplace can be equally applied in the marketplace.

### ‘Old’ Systems for a New Economy?

In the new economy, the ability to collaborate with others may be just as much of a competitive advantage as the ability to deploy the technology. The Internet is an entirely different category from the technology-driven changes that managers have either embraced or had thrust on them in the past. Enterprise Resource Planning (ERP) systems for example, have been inward looking, concentrating on making each enterprise more efficient in isolation. By contrast, the Internet is all about communicating, connecting and transacting with the outside world. With e-business the benefits come not just from speeding up and automating a company’s own internal processes but from its ability to spread the efficiency gains to the business system of its suppliers and customers. Because of the Internet, an alternative to the traditional unhappy model of supplier-customer interaction is finally becoming possible.

And that may mean not just re-engineering an organization but reinventing it with technology. The Internet gives customers unprecedented power to seek out the lowest prices, but it can also be used to deepen relationships and ultimately build far greater customer loyalty than before. Internet transformation calls for an architectural framework that promotes scalability, interoperability, and portability (Beveridge and Perks, 2000), and helps in the creation of an integrated value chain. This is a process of collaboration that optimizes all

internal and external activities involved in delivering greater perceived value to the ultimate customer (The Economist, June 26 1999). Before the Internet, companies struggled to speed up and improve their supply-chain interactions. The most effective collaborative tool has been EDI.

EDI, although effective enough, has several drawbacks. The first is that it is both limited and inherently inflexible. It provides basic information about transactions, but it is unable to adapt to rapidly changing market conditions. Second, it is very expensive to implement, so many companies find it difficult to justify the investment. Third, because it is based on proprietary technologies rather than open standards, it locks suppliers and customers together. Last, as purely business-to-business tool, it excludes the end-user from the value chain. Internet technology, argues Cambridge Technology Partners, is everything EDI is not. It is ubiquitous and open to everybody. The intuitive point-and-click interface of the browser makes it easy to use. It is flexible enough to work either inside an organization (intranet) or outside in open (public Internet) or secure (extranet) form. It is cheap to set up and run. And it is global.

It becomes clear that information systems and applications built to serve and support the traditional value chain do not suffice for the business models of the new economy. It is the very same technology and the extraordinary power of the Web that in helping in the creation of new business models are at the same time contributing in rendering institutionalized information systems fast obsolete. Our belief is that the above phenomenon warrants an investigation of the ability of certain types of information systems to satisfy the new criteria of value creation as dictated by the new economy. Consequently, this may mean a reconsideration of the pathways we used to follow in developing and employing information systems in the past.

## Research in Progress

At this point in time our research is focusing on defining the characteristics and abilities needed by an organization wishing to compete along the three dimensions of reach, richness, and affiliation. Empirical research is being conducted in the form of an exploratory case study at a multinational organization. For our research we have adopted seven key organizational dimensions for e-business as identified by Neilson et al. (2000) namely: *Organization Structure, Leadership, People and Culture, Coherence, Knowledge, Alliances and Governance*. Along those, several key value creation processes are defined aiming to aid the organization in achieving navigational advantage. Our efforts are focusing on defining how effectively the information systems in place could aid the new value creation processes. We expect our findings from this stage to

provide the necessary groundwork for further empirical work in a second organization, leading to the proposition of a number of general design and implementation principles for developing information systems in the new economy.

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