

out the seasons. The ancient Chinese emperors who were in service to their citizens fully understood leadership as a service occupation. The critical layer of global business, to the surprise of many, is the highly knowledgeable middle manager, who creates and implements the innovations that ultimately decide business survival and success. Of course, the middle manager who is only involved in information collecting and processing has no guarantee of survival since this position itself is being computerized.

This new managerial role requires open-minded CEO's, CFO's, COO's, and CIO's who can build networks for motivated "associates" who collaborate to achieve innovation, productivity, customer satisfaction, and profitability. The network starts locally, becomes national, and more frequently emerges globally. A new type of executive is necessary, not one who can only use a computer, but one who can learn to communicate easily with collaboration-oriented performers and who is not intimidated by the expertise of others. These executives are not necessarily the youngest or the oldest, but simply the best.

## **From Tasks to Culture Control**

Management has shifted from Goals-Objectives-Tasks to Vision-Culture-Results Management. Once a worker becomes his or her own boss and the manager becomes a facilitator, managerial control shifts from quantitative to qualitative aims. To support this new orientation and work ethic, executives must learn how to become leaders to provide a vision, to negotiate from the bottom-up with top-down goals, and to create a culture supportive of excellent performance.

A corporate vision must be provided by business leadership which integrates long-term value and architecture (a multi-dimensional, harmonic configuration of the company and its customers) with a defined philosophy, goals, and culture. This vision should also be generated by all the "associates" from within the firm. Such a generation of vision requires better horizontal communication which will energize the employees' spirit and joy for work.

# **SHIFTS OF INFRASTRUCTURE**

## **From Formative to Informative Products and Economy**

A shift from formative to informative products and economy, and a shift from hardware to brainware, is driven by a shift from traditional materials and

energy to new composite materials and knowledge-based products and services. New products are lighter and more functional, new houses consume fewer materials and energy, new American airplanes consume 30% fewer materials than a decade ago. The new Boeing 767 couldn't be built without computer aided design (CAD) and computer aided manufacturing (CAM). This new wave continues to expand: six billion microprocessors are embodied in all types of smart products, more than the population of the Earth.

The relationship between capital, labor, energy, and knowledge is shifting toward knowledge as a source of wealth. Big business relies upon mass markets funded by large capital requirements. But the small and innovative companies which can quickly produce new knowledge, products, processes, and services are the most profitable and have the fastest rate of growth. They may eventually become a large corporation, like Microsoft. Such as machine-tools are extensions of human muscles, microcomputers are extensions of the mind and will be gradually incorporated into many smart products and processes. New products and processes will self-control, self-repair, and self-reproduce. Robot factories will even produce other robots.

Previously, the informative economy required continual expansion, or so-called "growth." Now, a key of the informative economy is "downsizing," or "rightsizing," which leads to more niche-oriented products and services while it eliminates unnecessary operations and materials. Firms are producing more with less direct labor, but with better methods and automation, with empowered workers who do not separate thinking from doing. The empowered worker is often a white collar worker since direct labor is often below 5% of a manufactured product's selling price (Targowski, 1996).

## From Automation Islands to Federated Systems Architecture

The business of information is big business, and is rapidly growing larger. American companies spend 2% to 4% of total corporate sales on information services each year (2000 CPM Media, Inc.). Technology has made information an economic good that can be produced, bought and sold like many other goods in the marketplace. But information must be managed wisely and as productively as any other company resource. Most computer application systems were developed on an ad hoc basis. Each application was considered a separate entity with little or no connection to other computerized applications existing within the business organization (McKenney et al., 1982). Without an enterprise-wide flexible supersystem, there is no clear mechanism, from a



holistic business perspective, for the transformation of data into information and knowledge which will impact the business decision making.

Integrated, architecturally-designed, organizational computer-information programs can best be conceptualized through hierarchies of interconnected systems and subsystems which one can label "federated information systems." The following federated C&C (Computers & Communications) blocks include: Federated Information Systems, Data/Information/Knowledge Base, Company Software, Computer Systems, and Communications Networks. These enterprise-wide, federated systems create a business-driven "blue-print" for systems planning and the integration of information which allows the company to better compete in time, cost, product functionality, manufacturing quality, and customer service within the global economy (Targowski and Rienzzo, 1991).

A good example of such systems is a concept of ERP (Enterprise Resource Planning) provided by SAP, Baan, JD Edwards, Oracle, and others<sup>3</sup>.

## **From National and Traditional to Cross-Culture and Electronic Communications**

Numerous service companies and retailers have learned to transcend national boundaries and to conduct business globally. For example, the Limited, headquartered in Columbus, Ohio, uses electronic links with Asian based manufacturers to make and ship by air the latest fashions in a matter of weeks. Suppliers, shippers, and retail outlets are all linked by telecommunications, resulting in a competitive advantage for the Limited. Similarly, U.S. airlines are linked via computers and telephones with reservation clerks based in Ireland where wages are low and the level of education is high. Even the Fortune 500 has developed transcultural operations that yield in excess of one-third of the Fortune 500's total profits.

Ken Ohmai's "Borderless World" is a reality. Large technology firms are large only because of extensive foreign operations, as exemplified by the computer giants. In 1991 Apple Computer had foreign sales of 44.8% of revenues, while Compaq had 58%, IBM had 50%, and Hewlett Packard realized 56% of revenues from foreign operations (1991 annual Reports). Coca-Cola had soft drink sales of 2.6 billion in the United States, but had 7.2 billion in sales from international operations [4]. But a cold Coke tastes good anywhere in the world. The world leader in international operations as a percentage of sales is the ubiquitous Nestle, which had 95% of sales and 97% of profits from outside its native Switzerland. Even small U.S. companies such

as those producing computer modems have belatedly realized that high growth almost solely relies upon international sales.

### **From the Known to Unknown and the Dot.Com Crisis<sup>4</sup>**

The management of a turbulent environment is very challenging. We can learn about the factors that influence dynamic global corporations, but only indirectly, and often long after their impact has been made. A simplistic predictive model of corporate excellence is fun to believe in, but unfortunately, unrealistic.

For example, in the late 1990's the emergence of e-commerce known as a "dot.com" business created the economic boom, which later transformed into the speculative bubble. The boom stage of the Internet bubble lasted from October 1998 to April 2000. During that period, more than 300 Internet firms did IPO's (Initial Public Offerings of stocks). On March 10, 2000, the NASDAQ closed above 5,000. On April 14, 2000, the NASDAQ had dropped 1,727.33 points, or 32%. The Dow Jones Composite Internet Index was down 53.6% from its March 9 high. In just one week, \$2 trillion of stock market wealth had been eviscerated, Microsoft alone had lost \$240 billion in market capitalization since its peak, Amazon.com had lost 29.9%, and Yahoo! had lost 34.8%. The collapse of the NASDAQ was caused by unscrupulous alliances of entrepreneurs, venture capitalists, stock analysts, investment bankers, and too optimistic journalists who helped to expand and prolong the bubble. This failure can be named "*from dot.com towards dot.con.*" John Cassidy (2002) states that—"the collapse of the NASDAQ was a turning point in American history." Because, "for the past five years, the stock market, particularly the NASDAQ, had been a symbol of American technological leadership and economic power. Most of all, it had been a symbol of American self-confidence." The myth of the American technological might had been exposed. Unexpectedly, instead of the premise that the future is illimitable, the U.S. faced a future of economic, political, and cultural limits.

### **September 11, 2001**

The terrorist attacks hit the post-bubble economy, particularly punched in the minds of consumers. When the stock market opened on Monday, September 17, it suffered a fall of 1,300 points, or 14.8%, to 8,235.81. The sell-off represented investors' uncertainty about the future, and the attacks had largely emphasized existing limitations in the economy. The slow-down of the

economy slowed investments in information technology too. However, the Internet remains a technological wonder and despite of the fact that many dot.com ("dot.con") companies are long forgotten, we should look back on the 1990's as the time during which the information society became a reality. For example, the online edition of The Wall Street Journal has about 500,000 subscribers, most of whom also buy the print edition. Merrill Lynch offers online trades for \$29.95, but the greater part of clients also employ the firm's brokers, who charge much more for their services.

## **NEW RULES OF POST-MODERN BUSINESS**

We suggest a new revolution — not the end of history, but the dawn of a new era, as informed global business with new rules:

### **Rules of The Informed Global Business:**

1. From one stakeholder and system to many.  
There used to be a stockholder and one system that now are extended to more agents/systems influencing a firm's performance, such as employees, managers, communities, governments, NGO, and their systems.
2. Act locally, think and profit globally.  
Almost every local producer and service provider is affected by foreign competitors, hence the formers must organize themselves having in mind the global competition.
3. Customers, not executives, drive a business.  
The introduction of agile production supports mass customization which puts emphasis on how to please a customer, who chooses more suitable solutions and decides about a firm's success.
4. Knowledge is as important a strategic resource as capital.  
Knowledge embedded in products makes them more sophisticated and better at satisfying customers.
5. Cooperation precedes and is integrated into the competitive process.  
One firm is unable to spend enough resources on R&D and marketing,

hence must look for alliances to compete with stronger companies/alliances.

6. Lead time, innovation, quality, and utility satisfy a customer.  
A nowadays customer is more demanding from producers and service providers who must compete at the level of cost, quality, and lead time, which add value.
7. Do not separate thinking from doing.  
Advanced technological systems require that their operators are problem solvers.
8. The integration of the islands of automation into an enterprise information infrastructure leads to the gateway of the Electronic Global Village.  
The system's integration leads to less redundant components and communication which take place locally, nationally, and globally through telecommunication networks and the Internet.

## CONCLUSION

Perhaps in no time of history has the human race faced a brighter, but less defined and less tangible future. The historical paradigms of business simply no longer apply. We are at the beginning of a new era, and as exemplified by the Russian proverb, we must "break the glass." We must break our old paradigm and create a new one based upon an informed business architecture. Knowledge will allow us to accomplish more, with less, but this accomplishment will require new paradigms and much change.

On the other hand, we cannot exaggerate the role of information technology in the economy. Despite the rapid growth of the Internet and information technologies in general, firms still spend more money of industrial and agricultural capital equipment than they do on computers and networks. Many big industries that employ millions of workers, such as health care, catering, and construction are largely unaffected by the Internet. In the concluding analysis, manufacturing still has more to do with assembling parts of wood and metal than with processing information. The Information Wave just optimizes the Agricultural and Industrial Waves but does not replace them. Without these two Waves, the Information Wave could not have the reason to exist.



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## ENDNOTES

- <sup>1</sup> An informed enterprise is such one where its information resource can generate a value added knowledge about its business/organizational processes for the purpose of optimizing decision making.
- <sup>2</sup> However, Japan is in a long recession (1994-2002) and its *Pax Nipponica* did not succeed.
- <sup>3</sup> More information on ERP systems is provided in Chapter 4.
- <sup>4</sup> More on this topic is in Chapter 6.

