DENIS C. ETTIGHOFFER
PIERRE VAN BENEDEN

META-ORGANIZATIONS

The *Plug and Play* company

You, the father of writing, have been led to attribute it a quality which it cannot have; for those who acquire it will cease to exercise their memory and become forgetful; they will trust to the external written characters and not remember of themselves.
You give your disciples not knowledge, but only the semblance of knowledge; when they will have read a great deal without learning anything, they will think themselves quite learned. More often they will be tiresome company, having the show of wisdom without the reality.

Thamus, the king of Egypt, replies to the god Theuth's claim that writing will make the Egyptians wiser and give them better memories, as told by Socrates.

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FOREWORD

The world is becoming a huge piece of *groupware!* What an opportunity, but also what a responsibility for Lotus Corporation who thought it up in the 80's.

Four years ago, when we first talked about the book project with Denis Ettighoffer, we at least knew what we didn't want. Not a French book, too finicky and boring for our English-speaking friends, nor an American book where everything is served on a plate and is not to our European friends' taste. As much as the former hate "potted" managerial thinking, finding it often too simplistic, the latter get irritated at irrelevant considerations that don't get to the heart of the matter.

With Denis, who wrote the first French book on the virtual company in 1991, I had found the man I needed. We shared the same views on reading. Managers have so little time to devote to reading that it should be spent discovering the diversity of the world and the different ways of organizing companies and organizations rather than on narrow-minded hypotheses. I thought that was important when talking about an overall vision of the numerous transformations that are happening as a result of the development of networks and the use of collaborative work in a virtual economy.

Our respective experiences, as manager and consultant, have led us to believe that managers want to free their minds of all these new-fangled and fleetingly fashionable ideas, and concentrate on new ways of reasoning and new stimuli for their teams as they launch their companies into the Internet Economy. For his part, Denis didn't want to write just a recipe-book for consultants. While working, he often noticed that when you start making changes to organizations, it is a miracle if you don't make them worse. As far as I was concerned, I wanted to demonstrate that disseminating technological applications is not an end in itself, but should be an opportunity for fundamentally overhauling organizational thinking. The way in which the economy, society and exchanges in general are becoming virtual is a sign that the time is just right to create new types of organization better adapted to the century of networks.

Each age has created its own corporate or enterprise model, and that of the 21st Century will be a virtual one. We wanted to show how a new look at organizations helps in renewing strategic thinking, which is often rather conventional. This virtualization of the economy and of organizations has indeed become the crux for shifts in strategy. We wage economic war using all sorts of virtual business models to create value and differentiate ourselves on the markets. Besides, you only need to read financial press reports on the rise in value of up and coming start-up companies listed on the Stock Market to appreciate the strength and the value of the virtual model they have thought up. Clusters of companies are uniting and forming meta-organizations, organizing themselves as networks, either to reinforce their co-operation while remaining independent, or to be part of a joint network to increase collective production.

A new inventiveness is appearing in the various ways wealth is generated: working on organizational models to increase productivity and added value all together. Don't look any further for either the American growth miracle or the French economic turnaround back to growth. They reside in the quality and the global productivity that meta-organizations are going to produce in this new century. That is what this book is all about, offering new ideas for work opportunities, and taking us on a trip around the organizations of the future, a world where we are all going to be telecommuting and doing business together.

PIERRE VAN BENEDEN
SENIOR VICE-PRESIDENT
LOTUS CORPORATION

INTRODUCTION

"I used to think all eccentrics were crazy
but now, I think eccentric is just the normal
state of all human beings"

Anton Chekhov

This book is not about the art of management. It's a book about the art of organization development. Organization development can be defined as the invention of structures and systems that are constantly reprocessed and transferred from one generation to the other. Most importantly, they are especially resistant to errors in management. Organization is often an underestimated, misunderstood and mystical art since the self-organization of information systems is clearly superior. It is even clearer that networks of computers are going to make the implementation of "ready-made" organizations, which limit management errors, even easier. Managers are rarely aware of the fact that they owe their talent in part to the quality of the tools they operate. These tools can be all the more valuable when there is an efficient business model behind them.

Many books have been written under the direction of corporations and their executives about managers and management. Years of experience have left us dumbfounded. All we can see is the rapid obsolescence of management methodologies and modes. Generations of managers who all have their own favorite model, usually designed to comfort their failing egos. Not that profits were that much better in the Nineties than back in the Fifties. So what has changed? It's probably the same old driver, but with a brand new vehicle.

We are totally convinced that winning is more often the result of the competitions' blunders than one's own ability. In other words, there are more competitors driving themselves into ditches than there are companies capable of rising through the ranks because of their performance alone. La Bruyère, who wasn't averse to conducting his benchmarking studies at Esope, summed it up very nicely: "there are only two ways to get anywhere, through your own hard work, or through the stupidity of others [...]".[1]

Of course we all ask ourselves whether all those managers who run their companies like Sunday drivers don't have some sort of guardian angel watching over them. What sort of conclusions can be drawn about a company like that? That if it works, it's not because the driver got any better but because the vehicle and the infrastructures are more reliable, more efficient. And that we are building vehicles, organizations that is, that hold the road better and better on highways that are becoming faster and faster.

Instead of talking about the methods of running a company, this book ignores the drivers, their strengths and weaknesses, and the passengers, to focus on the incredible proliferation of all the new systems that are currently cropping up under our eyes. Systems that endure even the most hazardous roads their drivers dare to venture down. We will also illustrate the importance of investing in new organizational models.

1 Jean La Bruyère, Les Caractères (Paris: Dunod)

You may ask what models we're talking about since we are also basically witnessing the end of models. From a few typical and easy-to-reproduce models we'll continue on to a fabulous mushrooming of combinations between economic players and companies to better serve their clients, increase profits and stand out from the rest. Each company must adapt to familiar yet new situations that force it to forge new partnerships which will be more or less value-creating.

In a context of increasing instability, when companies are continuously trying to adapt, many companies are in jeopardy because they are enduring significant organizational deficit. Having become very interdependent, they stagnate or decline, for lack of understanding on behalf of their executives of the possibilities of NICTs (New Information and Communication Technologies) to create new means of wealth, while their competitors successfully take shape by going virtual within the networks of the 21st century. This book is about the foreseeable transformations of the 21st century corporation. A story where only the most daring grab the best opportunities, and the keys to success of the new virtual corporations are right at your fingertips.

1. The organizations of the 21st century transform to create value

Corporations have constantly evolved over the last century, but a new paradigm caused by the dematerialization of the economy and organizations is suddenly accelerating their transformation. It is now possible to create wealth by adding a little intelligence to the corporate organizational scheme. What we are witnessing is a tremendous period of inventiveness, stimulated by the virtualization of organizations. A movement that leaves the old corporate reengineering or reform operations behind like waves leave foam on the seashore.

More significant than the transformation of existing corporations is the fact that we are witnessing the creation of new economic models that give rise to new types of organizations. These are networks of corporations that combine into more or less large meta organizations to create value, clusters of corporations that collaborate closely and form meta corporations, or become highly integrated corporations called meta networks. Most of these meta organizations are the result of the search for a business model capable of creating value better than a traditional one.

"Inventing the Organizations of the 21st Century" is the name of the workshop conducted by Thomas W. Malone, professor at MIT. We have yet to find anything similar in Europe[2]. However, we have found quite a few research initiatives on virtual corporations and organizations, including the Nectar project run by the Commission of the European Communities. The notorious linguistic barriers and lack of leadership in Europe account for the confidential nature, the messiness and the general feeling of incompleteness of many projects launched since 1996. In the works of Thomas W. Malone and his team at MIT one can find the major characteristics of the transformations regularly discussed in specialized

2 Following an extensive search on Internet search engines. See www.eurotechnopolis.org.fr (International Observatory on Virtual Corporations and Organizations)

books: the downsizing of large corporations, the increased outsourcing of the links in the chains of traditional value, the development of communities of individual entrepreneurs, the standardization of exchanges and the deconstruction of centralized management, the development of partnerships and virtual corporations, and finally the need to build a culture of trust. All of these topics have already been discussed in other books.

In this book we'll be going back over the specific impacts of NICTs on the diversity of business models and the importance of organizational innovation in creating wealth. Instead of the business models of the net economy, we'll be focusing on the inventiveness of different types of virtual organizations at achieving collective productivity gains or creating excess value. This trend seems more promising in terms of sustainable development than the present significant stock market speculation on netcompanies. We'll also discuss the strategic adjustments these transformations will involve in terms of alliance policies and technologies management, now of prime importance, and the choice of the best model for a company that has now become the symbiotic link in this vast ecosystem known as a meta organization.

2. What big changes lie ahead for the corporations of the future?

In the first part of this book we'll explore the evolution of virtual organizations, and the companies of the future, into meta organizations. Each era is marked by its own organizational model, depending on the economic, cultural and historical context of the time. The virtual corporation has become the symbol of the cooperative organizational model of the cybereconomy. The companies of the future are clusters held together by networks called meta organizations.

The formation of collaborative organizations can only occur in a cultural context that favors exchanges and sharing. One of the challenges that companies must face in a context of increasing interdependence is to understand and know how to handle cultural hindrances. Clinging to an obsolete business model, just because it worked a few years ago, will only lead you to catastrophe, especially now that the transformation of traditional organizations is accelerating. It'll give you the chance to demonstrate that technological superiority isn't worth a dime if you don't have a good organizational design.

In the years to come, the goal of most companies will be to set themselves apart from the competition by designing the best collaborative organization in the world. Doing this, as we will explain in the second part of this book, involves knowing how to disorganize the existing company to better invent the future. Idea men will play an increasingly important role in the design of innovative organizational – hence business – models. The proof lies in the fact that the stock market favors organizational clarity and innovation almost as much as management quality.

But the question of traditional models is still a difficult one. The Linux operating system could have never thrived within a traditional organization. The neteconomy and the organizations now being designed are totally underestimated by the generation of executives born in the post-war period, hardly prepared to handle what it considers to be an unlikely economy, product or company.

Virtual organizations, typical 21st century companies, are becoming instruments that participate in the creation of added value, of wealth. They will also be the source of an incredible biodiversity amongst organizations. With the development of outsourcing due to the widespread phenomenon of subsidiarity, where everyone focuses on what they do best, each company tries to find the organizational solution that suits it best.

Virtualization is becoming one of the key factors of competitiveness between companies because it allows for the better use of computer network resources. New virtual business models are emerging from the usual standards. Innovations in terms of virtual organizations work on the assumption that the company of the future will be a co-corporation, an ever-changing value chain. The art of alliances and of partnership will dominate. The art of collaborating will be just as valuable as the art of management. The goal is to form a winning team and invent an original business model that improves profitability. The fortune you make will be used to hire, or keep, the best professionals, some of whom may work for several companies at once, through the possibilities of telework.

By drastically changing the organization of value chains, virtualization reduces operating, coordinating and cooperating costs. It promotes access to intangible capital, and helps regenerate the industrial and economic fabric by changing the traditional economic models, rules of competitions and power relationships among the regions of the world.

In the third and fourth part of this book, we'll take a long look at the different structures of network corporations. There are two distinctive types of meta organizations: the meta corporation structure and the meta network structure. We'll show you how intranets and extranets participate in the structuring of these entities to gain in productivity and added value. First we illustrate the tremendous development of clusters of network companies and its consequences. These meta corporation-type meta organizations are established according to a logic of combined added value, and on the basis of knowledge exchanges or resource sharing among partners by developing close cooperation. The players may play a more or less significant role here but the collaborative system is still very important, allowing virtual professional communities to take advantage of this organization. These meta corporations develop comprehensive products and services to increase their turnover, and profit from the law of increasing returns.

We'll show how they also use "virtual industrial zones", or shared service platforms, to create economies of scale. Associates, partners or enablers, meta corporations develop numerous approaches to cooperation. Co-development, co-production, co-distribution and co-marketing are the work of virtual professional communities, which also develop new competitive strategies.

In the fourth part, we'll take an in-depth look at the comprehensive virtual organizations, or meta networks, at the origin of the US economy's incredible productivity gains. Capable of hyperproductivity, these meta networks will more likely develop in a logic of domination where one leader tries to impose itself on a group of companies by using a highly integrated information system. The main objective of meta network organizations is cost reduction. They're looking for the greatest systems efficiency and the highest interface productivity by increasing the automation of the network: virtual corporations go "plug & play".

We'll discover the reasons behind the significant development of tracking: the tracing of objects, people and information for applications of the forecasting tools needed to operate intelligent networks. Networks that will eliminate the weak link in the chain, humans, and replace them with "ready made" off-the-shelf organizations: by further increasing the automation of sales and marketing transactions, Big Brother becomes an intelligent hyperproductive e-commerce network.

In the fifth and last part of the book relative to the creation and management of virtual organizations, we'll discuss the methods of virtualizing organizations, of building virtual communities and managing them. We'll talk about the new keys to excellency of virtual corporations. Managing these types of organizations of the future involves changing certain management logics, or the strategic approaches to their development. It still isn't easy to move from the concept of virtualization to the actual fact of "being" virtual. It's the end of gosplan: opportunist management takes precedence over grandiose strategies.

Managers will have to arbitrate between "soft organizations" and "hard organizations": the former favor alliances and cooperation among partners to create value, the latter favor systems hyperproductivity by limiting human intervention. With federated management, executives will also have to adapt to running a virtual, yet highly relationship-oriented, organization.

They'll still have the possibility of using networks to better stand out and gain competitiveness by reengineering their virtual business model (VBM). They can then use their virtual professional communities to impose it. A VBM becomes the key to differentiating their company on the market, as well as with their shareholders and clients, for whom it creates value. This need to stand out better accounts for the sudden emergence of a new "given" for the corporation accustomed to fighting over its prices and the functional characteristics of its products: the best way to stand out will be to build a community charged with feeling.

Finally, the last chapter emphasizes the danger of running your company on automatic pilot. The big question when dealing with a new systems-context, such as meta organizations, is where the accident will come from – the big crash that, caused by a third-party, will take even the most secure information system by surprise – and how to proceed on the big day.

This book presents a myriad of new problems, both amusing and not-so-amusing, which the executives we interviewed for this book seem to face with an open mind, ready to throw around ideas, old and new, with their management teams. At the end of the book, we'll spark a new debate with the question that concludes our work: "Are we ready to compete using organizational models?".

The main object of this book is to talk to the "drivers" about what they know least: the changes occurring within their own organizations. In this book, which follows up on ideas that have been tossed around since the late Eighties about the evolution of virtual corporations and the impact of NICTs on new working arrangements[3], we promise to respect three principles.

- Demonstrate that adding a touch of imagination to an organization can be very profitable, besides renewing your competitiveness.

3 The Virtual Enterprise or New Ways of Working (Odile Jacob, 1992) multilingual versions available on the Internet at http://www.ettighoffer.com.

- Try not to be boring or too technical, by using examples from all over, especially on-site with the Lotus Corporation award.
- Give executives of large or small companies enough to think about to encourage them to create – if they haven't already – their own meta organization and their own virtual professional community.

This book rarely discusses methods. We preferred to write a book about future planning, a story about the adventures we all could face down the road, instead of just another book on management. There are lots of ideas bouncing around in here. You hold the finale in your hands; you and your "dream team" can make your company the hero of this great adventure.

DENIS ETTIGHOFFER
PIERRE VAN BENEDEN

APRIL 2000

I. THE VIRTUAL CORPORATION: MODEL OF THE THIRD MILLENNIUM

"No future for those who don't think about it"

John Galsworthy

In the 1940's, Carl Yeager[4] was a test pilot on an airbase in Arizona. Like other pilots he was attempting to break the famous sound barrier. It was a global challenge. There were numerous technical difficulties. As soon as the plane, in a nosedive, approached the speed of sound the pilots would lose control of the aircraft. It eventually happened to Yeager, too. Like the pilots before him, he desperately pulled on the control stick to regain control of his aircraft, which was plunging down from the sky in an uncontrolled spin. The crushing centrifugal force prevented him from bailing out. As a last resort, he made a decision other pilots would consider an insane risk. He pushed down on the control stick as though he wanted to dive even faster. Presently, his plane began to react and he was finally able to regain control. Why? Because as the plane reached the speed of sound, the aerodynamic stresses exercised on an airplane change fundamentally, creating negative lift in a nose-diving airplane. That's why supersonic planes have different wings than other aircrafts. To sustain an airplane's lift at extremely high speeds, aeronautical engineers invented the critical and supercritical wing, both characterized by a hollow underwing. Over the years, aided by onboard computers, they have designed airplanes capable of performing correctly at any speed and under any type of subsonic or supersonic flight condition.

Modern corporations face a similar situation. In the era of real time, just-in-time methods, the networking of the intangible economy, global knowledge exchange, and virtual corporate communities, companies are discovering that they'll have to adapt to working conditions that are at times both conventional and alternative. As in recent avionics, the company of the network age will have to invent an organizational model that complies with the laws of the cybereconomy and highly performing systems, while adapting its flight instruments accordingly.

Computer networks will be to the 21st century what maritime communication channels were to the 17th and 18th centuries. Colonial trading posts were the source of fortune and fame for the conquering nations of the time. Nations are competitive when they have the capacity to stimulate the global economy in the conditions most favorable to their companies. What could be more obvious? The vitality of idea exchanges also depends on the behavior of the entire social system, and its elites, when faced with these strange techniques that situate Tokyo only five seconds from Montreal or Rio de Janeiro, Moscow and Peking. How world leaders decide to equip themselves and participate in the conquest of the economy of the future will be the key to their political, economical and cultural survival. In mid-1997, a senator from

4 The American Carl Yeager was the first pilot to break the sound barrier on October 14, 1947, with a Bell X1 rocket plane attached to B-29 mother ship.

Wyoming submitted to the Senate a motion concerning the possibility of using laptop computers during sessions. The commission vetoed the motion, claiming that the use of laptops would ruin the mystique of the place, still furnished with old wooden desks and inkwells[5]. This little anecdote symbolizes the attitude of the elite all over the world, who have never felt the need to ponder the significant role of technologies in the changes affecting our society[6]. This includes all of western civilization: "Until very recently the impact of technology on the economy wasn't even considered a legitimate preoccupation, "*Jusqu'à tout récemment, l'impact de la technologie sur l'économie n'a pas été considéré comme une préoccupation légitime des pouvoirs publics. Année après année, ces derniers ont investi massivement dans le progrès technologique, mais essentiellement pour des missions publiques bien précises: la défense nationale, l'exploration de l'espace, la santé. Les applications commerciales des technologies ne les ont intéressés que secondairement, voire pas du tout.*" This text appears in a report commissioned to MIT (Massachusetts Institute of Technology) in 1986 on the decline in productivity and competitiveness of the American industry at that time[7]. (see translator's note)

Make no mistake. Despite the media hype created around the neteconomy, the majority of our current organizations are still reflections of the early-20th century economy. Corporate organizations are still affected by compartmentalization and the isolation of their functions from the markets and the intangible economy. Like a plant that can't grow properly without fertile soil, the intangible economy can thrive only when our society is capable of letting go of its fear of technological progress and, above all, putting its genius to work in its products, services and organizational methods. In his *La quête incertaine*[8], Jean-Jacques Salomon reminds us, "*A country can develop only when there is a meeting point between its economical, technological and organizational cultures."* Due to a lack of understanding and widespread expectations about the impact of information technologies on their sustainable development, our societies, like our companies, are likely to experience a "socio-organizational blackout". The fact that this process of low organizational inventiveness could constitute a true historical catastrophe for the economy of a nation doesn't really seem to bother many people[9].

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5 Observatoire Européen des Télécommunications, (November 21, 1997)

6 According to two recent studies, American CEOs claim to be out of touch when it comes to modern information technology and 88% admit they don't do anything about it.

7 Micheal L. Dertouzos, Richard K. Lester, Robert M. Solow, and the MIT Commission on Industrial Productivity, Made in America, Regaining the Productive Edge, 1987

8 Jean-Jacques Salomon, "La quête incertaine", Economica, (Paris, 1994), see also Michel Dagonneau, Philippe Hayez, Bernard Mély, "L'émergence technologique de l'Asie Orientale", Futuribles, (November 1997).

9 In rankings of the most competitive countries, The United States placed second behind Singapore. France came in 23rd, down from 1997, according to the World Economic Forum in Davos. According to indicators, France could drop 10 more spots over the next few years.

1. In the last thirty years, there has been no significant advance in the thought process concerning organization

In each era, technological progress has led to the emergence of new organizational models. The organizational sciences have been the object of a considerable number of advances. The majority of these – including those of Crozier, Touraine, Morin and Gélinier in France, and Peter Drucker, Georges Friedmann, Frederick Herzberg and Mintzerg in the US and the UK – are the work of scholars. They dissect and analyze the socio-organizational behavior of individuals and speculate on the relationships between power groups[10]. Others, like the English Thomas Burns, and later the American Michael Porter, were more interested in the pressure of the market and the environment on the transformation of organizations. But, generally speaking, the real conceptual advances and the fundamental transformation of corporate organizations can be attributed to men of action, to workers in the field. Frederick Winslow Taylor in the United States, a mechanical engineer in the 1890's, and Shigeo Shingo in Japan – who, coincidentally, also started out as a mechanical engineer – fundamentally and concretely revolutionized industry. Shingo was eight years old when Taylor died. The former, scrutinizing elementary tasks, attempted to design an organization and administrative engineering system by demonstrating the highly positive impact of productivity. The latter tried to demonstrate the importance of an integrated approach to production processes: work conducted in small batches and without stock (zero stock), the drastic reduction of equipment replacements (zero lead-time), and the rejection of hierarchical controls in favor of self-inspection, to reduce defects and breakdowns (zero defect). He was also the first to demonstrate the advantage of a global approach to productivity, at the same time promoting the Kanban system[11]. Each in their own way, these two men symbolize their era, one preferring the sequential analysis of tasks, the other introducing industry to systems engineering.

1.1. Each era is marked by its own organizational model

Alfred P. Sloan, who finished his life as president of the board of directors at General Motors, is the perfect example of the great revolutionaries of organizational thought in the early 20th century. He started out as a worker in a failing ball bearing company. Three years later he turned the company around and became its president. One of his suppliers bought him out and handed him the reigns of his motor factory, United Motors. The factory joined General Motors in 1918. He was 43 years old when he joined the executive board at General Motors. As soon as he arrived, he was presented with the challenge of better coordinating the operation and control of the corporation's different divisions, which basically operated like little independent companies and weren't making cost control very easy. He began by regulating the relations among the different industrial units. After much internal resistance, he finally applied his ideas in 1922 when he centralized functions like accounting, finance,

10 We noticed that the quasi-encyclopaedic work of the Frenchman Jean-Christian Fauvet on social dynamics is not very well-known outside France.

11 Customer orders now "pull" a factory along whereas in the past factories were organized to according to internal constraints.

purchasing and invoicing. This made financial forecasting and economics of scale much easier. He took advantage of this to reinforce the management of these functions by launching the first projected reports of production programs, in phase with the results of the surveys conducted each month at the manufacturer's dealerships. In an era where indirect costs were considered totally secondary, he also standardized cost ascertainment procedures, and the forms used to justify investment requests. This might seem old-fashioned today, but in an era where the "factory" culture was dominant, it was really a change in mentality. His second stroke of genius was to understand that the strength of a large company was in knowing how to decentralize with one hand, and better coordinate with the other. Decentralization increased the responsibility of the unit managers. Continued development, coupled with the reinstatement of promotions for all functions, made it possible to limit excesses in relation to the industrial orientations required by headquarters. Action-oriented, Sloan already thought it was the main office that should be at the service of the industrial units, not the other way round.

Today, the stock market value of GM, the symbol of a bygone era, is often compared to that of Microsoft, a company representing a different era. Perhaps we should mention here that the year Bill Gates celebrated his first billion, GM was the second largest corporation in the world with 2.8 billion dollars in sales and 750,000 employees. It was the end of the transformation of an era. The new era was just getting started; the economy, along with corporations, was entering the Electronic Age. Today there exists a third era, represented by the huge merger between Time Warner and AOL. The software industry is giving way to the net economy, by creating a new age where fortunes are based on the new economic models resulting from the potential of information and communication technologies. In this era, we're forced to radically change our ideas about competition.

1.2. The virtual corporation as organizational model in the network age

Behind these spectacular mergers – eclipsed by the importance the media lent to the reorganization of certain multinationals – a fundamental reorganization of entire areas of industry and services is in progress. It starts with the relative downsizing of large companies and the upsizing of small businesses, and continues with the formation of corporate networks, which form professional clusters to better serve their business interests. The whole of it modifies the chain of added values, which links the upstream and downstream of highly specialized jobs, to such an extent that it challenges the whole question of the "core of professions".

With the reduction in transaction and coordination costs made possible by telecommunications, the efficient size of a company is being adjusted downward. The size of production units is still determined by economies of scale, in an attempt to optimize industrial tools and investments. However, the critical commercial size of a company is conditioned by the size of the markets, hence the development of partnerships to ease trade expansion. Finally, it's the management and research & development functions that finally determine the optimal size of new organizations. Reebok only kept the marketing and research & development functions, and saw to it that its information network stimulated its entire network of partners. All the other functions were outsourced.

In the future, in place of an economy dominated by large corporations representing a given country, we'll see a group of small operational multinationals, or even micro multinationals, organized into virtual professional, market-oriented and highly responsive communities, which will increase the opportunities to use the "global sound" of telecommunications to develop their businesses.

The virtual corporation lies in the artifact of electronic networks. Interactive, these polycellular organizations collaborate in function of the different opportunities to meet new demands with new products. An increasing number of "systems" products resulting from the temporary cooperation of several companies is now available on the market. Already 80% of new consumer goods are the fruit of short-term collaborations. A need appears somewhere, a specialist identifies it, and launches a new product, working in partnership with other companies and using a great deal of telecommunications.

Thanks to NICTs, companies can manage activities globally through partnerships and reciprocity agreements. Sometimes these developments will be the cause of misunderstandings between virtual companies and network companies. Both types of organizations pursue the same objective: reduce the cost of services and, as result, improve the profitability of tangible and intangible capital. But, at the risk of exaggerating, if network companies lend the greatest importance to the automation of its collective processes, virtual companies tend, instead, to favor the use of human resources by developing shared skill work arrangements: collaborative work[12]. This will have an enormous impact on the industrial fabric and, especially, on job distribution.

Because of their responsiveness and flexibility, virtual corporations will undoubtedly be one of the most dynamic organizational models of the 21st century. They break with the conformist models (and conformity) where each company was trying to perpetuate its operations rather than adapt to its fast-changing environment. The virtual corporation is shifting from production economics, based on the accumulation of tangible capital and characteristic of the second wave of neo-Taylorian corporations, to coproduction economics, based on the collective accumulation of intangible capital, or knowledge[13]. Consequently, in modern organizations, corporations are switching from capital management to intangible capital management.

The contention of the virtual corporation predicates strategic alliances. They are the logical consequence of the increasing cost of intangible capital and the market's demand for responsiveness through total flexibility. Influenced by networks, we are shifting from the physical, tribal culture of compartmentalized organizations to a sort of diaspora of corporations: the corporation of the future is a co-corporation. This will have a significant impact on future management methods and organizational development.

1.3. The end of the competitive domination model

In the 18th and 19th centuries, any notion of competitiveness lied in the capacity of a given organization to dominate all the others. Big companies became stateless, while nations handled their champion athletes with kid gloves. This "might is right" system signified the

12 The two models can coexist.

13 According to Alvin Toffler's advances

capacity of an organization to capture as many resources as possible, at the expense of the competition. In reality, the states weren't the last predators to compete for the wealth available in their colonies. This cannibal reflex is still firmly fixed in a majority of economic systems. But today this competitiveness more often depends on a company's capacity to collaborate with other key economic players, with whom it exchanges all sorts of goods, services, and especially know-how, while striving to set itself apart and control a position favorable to its business.

The cooperative model involves a significant increase in transactions among the key economic players. This capacity for global transactions will be one of the criteria for modern competitiveness. It now consists of establishing partnerships with several organizations, to create wealth together. It's no longer about taking from others; it's about creating value together. A shift due, no doubt, to the particularity of the well- dematerialized information that passes from hand to hand yet remains available to a community where everybody tries to give it some meaning, interpret it and find some value-creating use for it. Dominique Guillebaud, president of Sun – a company that claims to have a healthy sales-employee ratio – pointed out that setting up their intranet, sharing and exploiting information collectively, helped increase sales[14].

Even very large corporations, or companies equipped with enough telecommunications networks to serve their own needs, can't afford not to gain access to the knowledge, techniques, services and products that represent an ensemble of components manufactured all over the world. Services are becoming systems-oriented and are mobilizing a growing number of economic players around the world. Stateless, research explores world-class ideas and knowledge. Capital is more mobile than jobs, and profits circulate around the legal and fiscal constraints of various regions. Companies, like humans, have to deal with totally new problems. Networks are used to cooperate, first to gain productivity, then to develop business. Companies are transforming, indicators are changing, and the concepts of prosperity and competition are changing with them.

1.4. Corporations adapt to the network age by shifting from "ego to eco"

Two symbols illustrate yet another metamorphosis in modern corporations: the ego, represented by the industrial corporations of the second wave, which lent more importance to the self than to exterior events, and which embodied by divine right the success of a nation; and the eco, represented by the companies of the network age that lend greater importance to exterior events, and to the key players of the economy and market, than to themselves. This profound cultural transformation will have an enormous technical-organizational impact.

By favoring the overall growth of dematerialized services and activities, advanced information technologies were disturbing the established order. Companies had to review their processes and approaches to resource organization. But this reorganization was generally pretty tentative, as organizational thinking was limited to the use of NICTs as a simple extension of their traditional approach to working and doing business.

14 One million French francs in sales per employee, according to the SUN's technical manager, interviewed in the April 4, 1997 edition of *Le monde informatique.*

The biggest efforts essentially involved the reduction of intermediation costs to accelerate just-in-time cycles and document processing, thanks to standardized data exchanges known as EDI (electronic data interchange). Up until the mid-Nineties, intranet-type applications were still focused on the "ego", the company's internal operations. Except under special circumstances, intranets developed mostly through the installation of local networks. The difficult start of intercorporate networks, which at first only handled financial teletransactions, remote reservations, or order and information taking, further accounts for the weak impact of NICTs on corporate structures, work methods and the value-creation chain.

The need to be close to one's markets, and the fierce competition among intangible capital-intensive countries (which have the advantage of being able to circulate freely within the networks) and countries with low labor costs, incited big corporations to set up affiliates all over the world. This migration modified economic flows, to such an extent that the total sales of relocated companies doubled, and some of these branches were selling goods and services from their new facilities abroad to their markets back home. But teleinformatics and inter-branch networks were still largely the privilege of large multinationals. Anyway, besides management control and production programs, there still weren't many latitudinal applications out there.

In the Nineties, with work and organizations set up on networks, companies suddenly discovered client orientation, which changed the structure of their databases and client server applications. As a result, the installation rate of online personal computers in French households rose to 20%, and to nearly 40% in American households. It accompanied the growth of electronic commerce and forced companies to pay closer attention to their relationships with customers and partners. Faster, shorter innovation, customized production and market phase cycles – as well as the pluridisciplinary nature of technical, scientific and commercial activities – generated a sudden demand for interaction among the players of a same value chain. These relocated units began to telework in cooperative arrangements, and were able to collaborate round the clock thanks to their different time zones. The need for networks increased along with technological investments.

To top it all off, a metamorphosis in value analysis incited outsourcing, due to the growing cost and need for intangible investment in the various activities in which the company wanted to remain globally performing. This global optimization was possible only by joining forces with several other companies, in an attempt to improve their economic performance by gaining in productivity over the entire value chain, thanks to the creation of a single information system for all, or through innovation, development and gains in market shares by using the services of a number of partners. This, however, involved increasing the number of combined alliances, to launch new products or services, and focusing resolutely on markets and clients.

2. Virtualization becomes a universal concept

There is a major reorganization of the economy and organizations currently in progress. This occurs about once or twice a century. With the virtual corporation, there has been a change in the organizational paradigm, and it is challenging the fundamental givens of existence, not to mention the operations of traditional corporations.

Once considered an aim in itself, companies are now exploiting, enabling and accelerating the creation of totally new organizations, sometimes only for limited periods of time. What we are witnessing is the cross-fertilization of intermediary structures, which replaces or strengthens existing ones. This is a downright revolution, which is also due to the fact that, with virtual companies, organizational innovations are no longer developed within the walls of a company, but can cross the borders of the traditional company, by relying on new types of partnerships.

Since it is becoming practically impossible for the majority of small or micro businesses to possess the entire skills base needed to efficiently control the value chain, they link this chain among a growing number of partners. New organizations settle in the networks with "marketplaces", a kind of virtual platform where business transactions among professionals and individuals abound. Commercial movements take form within these virtual communities, among people who trust one another and share the same languages and values. The capacity of a company, or more often a group of companies, to form a virtual community is becoming the next strategic challenge.

Faced with the breakdown of traditional models, companies and their managers – like supersonic airplanes – are forced to invent management concepts adapted to the network age. The key factors of success are changing. Generally, the most competitive companies will be the result of a successful blend between organizational innovation and the potential of NICTs. But their competitiveness will mostly depend on the quality of their alliances. These will often be the fruit of a series of chance encounters. That's why university professors can't put their fingers on them. The only thing that is clear is that new organizational concepts are developing out of the global virtualization of the economy, which is now the key to future competitiveness.

2.1. Is the virtual corporation a universal model?

In northern Egypt, near the source of the Nile, there is a legend circulating about how the world was created. After having created the sky, light, earth, nature, animals and mankind, God was tired and decided to rest. He fell asleep. He woke up hundreds of years later and wondered what had become of His creation. Alas, it was quite a disappointment. The most virulent, humans, questioned the existence of all these creatures who destroyed their crops and attacked their homes and families. The animals complained that they didn't have suitable places to live. The lions couldn't see themselves living in the mountains, the bears in the savannah, the elephants in the marshes and the gazelles in the in forest. Everyone whined and complained about their fate and misfortunes. God demanded silence, and pondered the wishes of each. He thought and thought. Then, with one stroke of His hand, He put each creature in the place most suited to its nature and talents. However, the legend relates that, irritated by their whining, He left humans right where they were, spread out all over the world. And that is why humankind was the only species without a Paradise of its own.

This story perfectly symbolizes the limits to the idea of a universal, global company adapted to the diversity of local cultures and economies. On the contrary, companies – like cities and countries – specialize by gaining a foothold in a local socio-economic niche. However, more or less strong interest links connect them throughout the world. In the past, the interdependence between local and distant consisted in the exchange of merchandise and

money, which allowed each party to further integrate the local fabric. Today this occurs through the exchange of knowledge, ideas and, of course, money. Each link in a niche of knowledge, of local know-how, becomes the symbiotic member of a community that coordinates its resources to better develop the interests of the group – without ever forgetting its own, of course.

In *The Virtual Enterprise or New Ways of Working*[15], rather than try to give it a precise definition, we preferred to place the emphasis on the three gifts that electronic networks have given companies: the gift of *ubiquity*, the possibility of being everywhere at the same time, of being virtually present, even for teleworkers; the gift of *omnipresence*, which allows the company to stay open 24 hours a day, by operating on autopilot; finally, the gift of *omniscience*, which gives it access to the knowledge of the world and, especially, its employees. Other books, which discuss this topic from different angles, will follow. Many of them will confuse virtual corporations with network corporations. To virtualize a large corporation, all you have to do is increase the use of telecommunications among its various units. In other cases, the typical virtual corporation will be formed by the representation, at times idealized, of a group of companies that, like ABB Petersen, belong to a same corporate body. The interest of such an organization lies in its capacity to reconstruct its organic bonds to suit particular projects. This implies a capacity for dynamic reengineering and internal inter-organizational transactions that is still not very common today.

We didn't feel pressed to offer a precise definition. We sensed the danger of wanting to standardize the combinatorial effects, in essence very complex, that electronic networks enable. There is no universal company, only economic units that specialize, just as there is no universal virtual corporation. However, it is obvious that certain forms of virtual organizations are more or less performing. The concepts at the origin of virtual corporations, though somewhat confusing at first, quickly demonstrate that they have their own specific laws.

2.2. The virtual corporations of the future form meta corporations or meta networks

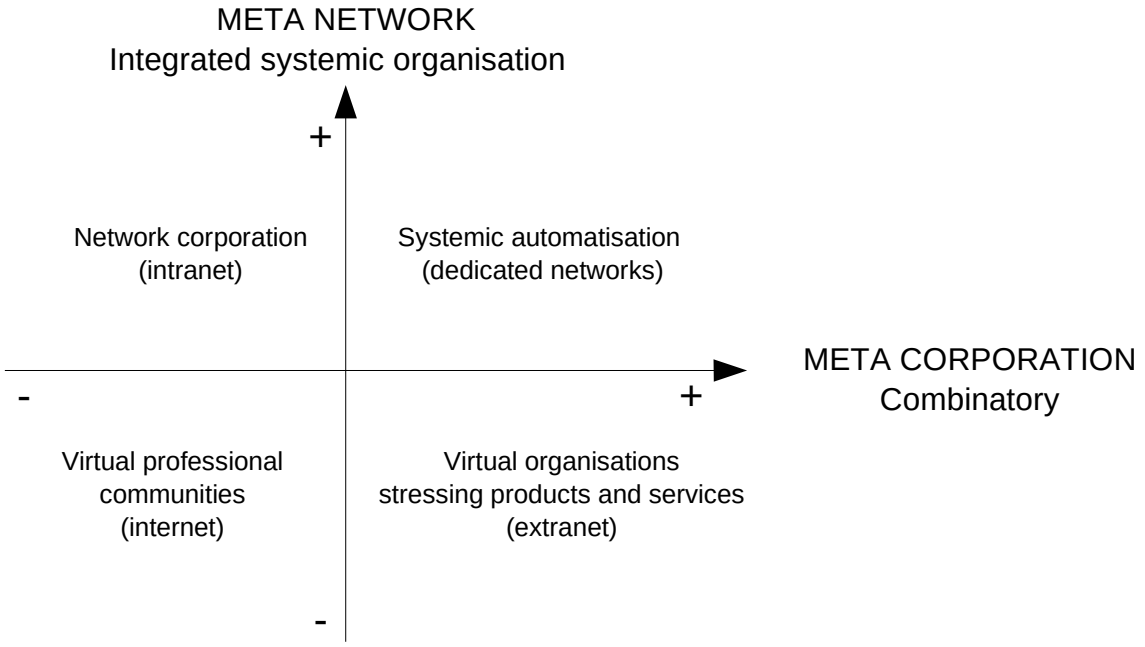
The means of structuring a virtual organizations are just as strict as the ones for traditional organizations. They function according to management rules that, though not really new, modify the relative importance of certain functions and hierarchical forms of organization. To return to the analogy at the beginning of this chapter, piloting a supersonic plane is much more delicate than piloting a small biplane, but both must obey the laws of aerodynamics. However, just like high-performance airplanes, the companies of the future will have to intensify the use of auto pilot support systems. In particular, they will have to incorporate intelligence into their networks and organizations.

In the end, though virtual corporations are a very promising solution for the overall development of organizations and the economy, it would be wrong to think of them as the company of the third millennium in its finished form. By reconstructing economic channels, companies are getting organized and structured into a multitude of more or less interdependent meta organizations, to increase their global performance. A McKinsey report,

15 Paris, Ed. Odile Jacob, 1992

dealing with the upgrade of "*lean production*" methods throughout industry sectors in the United States, Japan and Germany, challenged that the difference in productivity gains was no longer the result of manufacturing methods and standards[16]. These were almost the same everywhere. These differences in performance now depend on the choice of corporate structure.

Today we can identify two other big trends in the transformations currently in progress. The first one, for which we use the term *meta corporation*, structures companies within virtual professional communities, which have their own values and which usually develop intense multi-firm cooperative activities, either in their home communities or by approaching other communities. Theirs is a combinatorial concept (we will also discuss clusters of companies). The second trend reveals a structure of highly integrated complementary activities in a systems setting that favors hyperproductivity. The companies join a same value chain by using a common information network dominated by one player that leads the entire network: these are known as *meta networks* (see figure 1-1).



1-1. Meta corporations and meta networks

In the context of business globalization, these two models are structured around two concepts: a business development concept and a productivist concept. The former bases its development on an increasing number of design, codistribution and comarketing agreements for global products and services. The latter automates the maximum number of functions and activities to optimize the consumption of resources in a highly integrated, hyperproductive system.

One uses public networks to get coordinated and cooperate on demand, depending on the needs of the clusters of companies: meta corporations. The other integrates and structures complementary activities among various partners in a highly performing, usually owner, systems complex: meta networks. With an incredible capacity for functional autonomy, these

16 Michael Useem, "Les systèmes hautement performants", *Les Echos* (March 22, 1997)

will eventually become intelligent networks. These two trends are characteristic of the major trends corporations will follow over the next few decades, especially large corporations in the process of reorganization. They also mark the limits of the strategic choices of the key players, who will have to arbitrate between two development models conditioning their IT strategy.

2.3. As meta organizations, corporations are torn between maximum flexibility and total automation

Schematically, the model of the meta corporation favors strong cooperation and weak technical-organizational integration. On the contrary, the model of the meta network is characterized by strong technical-organizational integration, to ensure strong coordination. Meta networks are usually structured around information backbones, which consist of several owner networks linking the various players of the resulting value chain. Over the last few years, these VPRs (virtual private networks) have mushroomed, by forming extranets consisting of specialized professional platforms. In Italy, for example, Fiat created Intesa with the support of IBM; Olivetti launched Seva in joint collaboration with Seat, of the Stet multinational; Montedison, again with the aid of Stet, now has its Televas network; ENI, the national consortium, has built its Enidata network; and Pirelli just launched Pirelli Informatica. All these initiatives result in the installation of collective knowledge and management networks that form a chain of closely linked players, to better exploit their common resources. The problem is the flyaway cost of these infrastructures. It's prohibitive for small companies, and only reinforces the contractual power of the network "master", since the quasi-integration of electronic networks throughout the information system could be compared to a fatal technical-organizational collision for those who dare to free themselves of it.

Also, some virtual organizations focus on systems engineering and trying to master a specific intangible capital. Proximity to a university, a complex of research laboratories, a specialized industrial zone or a shared service platform, is a factor that favors efficient operating size. In this case, companies don't have to upsize by adding the functions they're lacking, something that could marshall significant financial resources and complexify the management of its business. Hence, the important role knowledge networks and local logistics will play in the establishment of companies, and the creation of industrial zones, in the future. In fact, the concept of virtual corporation doesn't necessarily imply that the units involved have to be distant from one another.

Generally speaking, all this reorganizing is an attempt to replace old features with new ones that, on the whole, are more flexible and economic. Thus, we can see that a particular type of meta organization is progressively forming, which basically will be organized along a horizontal axis to improve flexibility (the combinatorial), and a vertical axis to favor collective productivity (systems integration). In reality, they will be more or less interdependent, and more or less automated.

Softbank, a leading software distributor in Japan, is divided into virtual companies of 10 employees each. "*Like the ten fingers on our hands*," explains Masayoshi Son, the company's founder. Each unit is a micro company that functions as a profit center. This is no easy task. Many will no doubt attribute the success of this simple, flexible organization to its capacity to

get these units to work together when needed. This implies at least two conditions. First, that the permanent structure of the group's companies behave as the engineering nerve center, which, in function of the various demands and circumstances, favors, federates and controls the proper functioning of the alliances among the specialized components of the group needed to solve a problem. Second, that these companies are federated in an intranet that favors this cooperation, which includes sharing information and knowledge about certain problems or opportunities, which one of the members will take care of depending on the type of expertise needed. Fragmented organizations, virtual or not, can truly cooperate only where there is a common platform of information and services, but also a leader to run the whole thing. As in the age of Alfred P. Sloan, a network organization must be able to combine centralized and decentralized management, using the principle of subsidarity wherever possible. This is a concept we will find again and again in virtual organizations.

Virtualization favors a high degree of flexibility in an uncertain context but it also favors short-term relationships. Moreover, virtual corporations themselves are sometimes short-lived. Perhaps it's the "parade" of discussions that leads them to do business together. The most common way ways of creating a network organization are through intranets, which can favor both technical-organizational integration and collaborative work arrangements like groupware, or through less formal, temporary arrangements resulting from the business movement on the Internet known as "cooperative business." Companies get involved in the multi-party goods and services exchanges generated within virtual professional communities. The structure is weak but the cooperation opportunist, like the creation of a common advertising campaign or media event. These meta corporations end up in virtual communities that facilitate and favor opportunist behavior.

Some of these virtual organizations become better structured as they increase short-term deals or regular transactions. They become more permanent. Generally, they have a specific expertise and clientele, through the federation of the resources of several different companies. They are organized in clusters of common interests, in meta corporations. Their objectives condition the nature of their partnership contracts. Their respective size is not very important; partnerships are better nurtured by shared know-how than by power relationships. Of course, the latter still exist. It's just that the pressure tactics are different.

3. Information technologies have provoked drastic changes in our organizations

The countries of the OECD represent about 90% of the NICT market. The diffusion of information and communication technologies has become the number one indicator of a country's social and economic progress. The growth rate of the information industry is stable at 5% and undeniably contributes to overall growth. Between 1994 and 1996, it contributed 27% to the US gross domestic product (GDP), compared to 14% for the building industry and only 4% for the automotive industry[17], and 33% in 1996 alone.

17 Michael Mandel, "It's all hanging on high tech now", Business Week, April 14, 1997

In 1996, the Internet was still concentrated in the United States where there were more commerce web sites being reported than any other. The cybereconomy got its start in the US years ahead of the other OECD countries[18]. Advanced communication networks made it possible to reduce an organization's operating costs drastically, but also to launch new remote activities. Now, at the beginning of the third millennium, companies are eager to learn the ropes of the network economy. Here, companies find a low-cost way to globalize, to mingle with a multitude of economic players, including clients, with whom they now have a direct relationship. In our society of impatience, this is the most effective and energy-consuming way to work, trade and invent new products and services. One of the revolutionary accomplishments of the Internet is having created the Neteconomy, by becoming the first infrastructure that could be used by any company, or any person, to get to know its neighbors, to promote and share ideas or do business, and then get together with the ones with whom it shared common interests to form a group of bona fide interest communities.

It's no surprise that the Internet generation is one of the leading consumers of information technologies and online services. It falls within the analysis of social types and the very different behavior of certain categories of population towards technologies. The president of CIGREF (the information technology club of large French corporations), Claude Cargou, remarked, "*The Nintendo generation eats, works and sleeps in a virtual age very different from our own,*" while Pierre Carli, Informations Manager at Crédit Lyonnais, observed that 47% of French companies claim they are lagging behind their global competitors[19]. A series of studies conducted in turn by BIPE, Médiamétrie and NetObserver France, the specialized observatory of Novartis, illustrate these different social types. It results that over the age of fifty, a general disaffection towards NICT equipment and their use occurs[20]. A study conducted by InternetTrak III[21] in three European countries came up with an identical conclusion. These are pretty frightening results if you think about the fact that this is the generation currently running our government and large corporations.

The widespread use of information and communication technologies is at the origin of the changes occurring within our companies – and within our society. It is the cause of three major structural changes in our society:

1. It has radically changed the economic fabric (of companies and the work world) and our economic models.
2. It has facilitated knowledge exchange, through increasingly dematerialized cooperation, by favoring the development of virtual organizations.
3. It has allowed companies, and countries, to explore new ways of organizing the employment of their resources and creating wealth.

18 OECD (Organization of Economic Cooperation and Development) source, "Perspectives des technologies de l'information", 1997.

19 01 Informatique , (October 1, 1999).

20 Bénédicte Chauvet, "Génération Clic-Web", Le Monde Informatique , (October 22, 1999).

21 November 98 survey conducted by Dell, Ziff.Davis, KPMG and Intel in Germany, the UK and France.

These changes have had considerable secondary effects. The first forced and enabled technologies to communicate between themselves thanks to the TCP/IP standard. The second generated a hypertext navigation system, HTML, which virtualized knowledge access. The third broke down all the barriers among traditional organizations, which favored the formation of meta organizations.

3.1. The Internet, the Esperanto of electronic networks, is shaking up our companies

Thus, the World Wide Web has become one big global "Plug and Play" network. A universal standard, an Esperanto of electronic exchanges among machines determined by a concise IP (Internet Protocol). All the machines speak the same standardized language, which after some difficulties seems to have converged towards a universal operating platform. In the future, this Esperanto IP, and its developments, will make it easier to exchange among even the most ill assorted systems. Science fiction writers once imagined that all machines would one day join together into one big network, which would form a sort of supra-intelligence that would either boss helpless human beings around, or serve them hand and foot. Today, this big network exists, and it's capable of transmitting sounds and images, and of making work and business even easier.

All you have to do is get the right material, usually pretty inexpensive, to hook up to the "global sound". The IP standard also makes it possible for any kind of equipment (even personal computers) to communicate. This works even better with industrial computers by remote control. This general standard also makes it possible to avoid the IT investments needed to carry out EDI-type standardized teleinformatics exchanges, in favor of exchanging documents or files over the Internet. Actually, these types of exchanges offer a wider range of multimedia possibilities and online services, like remote supervision. In a traditional informatics setting, companies and contractors would have had to use several different systems to collaborate with their clients. With the standards used by the Internet, this is no longer a problem.

Though invented nearly thirty years ago, the development of the Internet exploded during the second half of the last decade. The Internet is an inexpensive means of communication that makes it easier to gather fragments of information and analyze them, thanks to another ingenious invention known as HTML[22]. The number of applications mushroomed. From simultaneous engineering to electronic commerce and telerobotics, the possibilities end only where the user's imagination stops – not to mention his or her computer skills.

The Internet will eventually serve as Intranet, inexpensive internal and external (extranet) networks. Nearly half of all web servers functioning under TCP/IP are used internally: in 1996, 22% of the top 1000 American companies were using the web as their intranet and 40%, according to a Forrester Research study[23], were thinking of installing it very soon. But in the early Nineties, except within initiated and specialized circles, the famed intercommunities, or virtual communities, were still confidential. Even in 1999, when we asked the question at conferences, only 2-3% of the persons present claimed to use Usenet on a regular basis.

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22 HTML (Hyper Text Mark-up Language) is a standard of indexing hypertext, hypermedia documents that facilitates the search for information in any server in the world.

23 Datamation (May 15, 1996)

3.2. Corporations must review their information strategy to comply with 21st century standards

Drastic changes are occurring that are shaking down the foundations of value creation, to such an extent that the impact can be heard round the world – and within each company. We have entered a long cycle of economic transformation. The growth of new network industries and services is off to a good start. The distribution of goods and services is undergoing a number of profound changes. The existing ratio in price decisions, between work and capital intensity, is being challenged. The mechanisms of diffusing knowledge, and the life cycles of products, have changed, and corporate and institutional organizational models are being seriously challenged. Finally, the creation of new jobs creates a skills deficit in activity sectors and markets that were unknown only a decade ago. In short, this economic and organizational reorganization won't spare many companies.

Dynamic reallocation and real time management of the resources needed for a company to operate, growing demands for commercial information, the need for maintenance, for training programs that keep employees' skills updated, and the development of collaborative networks to render knowledge more profitable, are all factors that contribute to a system's global performance. If one of them isn't up to par, the whole system suffers. To limit this risk, companies change in an attempt to comply with the standards of the 21st century, to become a set of almost interchangeable modular components. Companies become "plug & play", a situation that will change their fundamental needs, information policies and, to remain coherent, organizational models.

These changes will be four:

1. The IP standard and Internet traffic, sources of growing congestion on the current network, will no longer be sufficient to respond to the demand for high speeds. There will be a growing number of alliances among users and companies. Between 1990 and 1994, the number of strategic alliances in the sector rose from 2,721 to 4,325[24], with the aim of improving the effectiveness of the web, thanks especially to VPRs, virtual private networks. The intermingling of functions among a growing number of companies creates opportunities to install a dedicated private network that merges the specific alliances formed between companies to round out their resources or services.
2. Platforms of specialized computers, most often externalized, will be needed to meet the demands for computing power and security. Public policy, which encourages the formation of areas of activity like specialized teleports or virtual industrial zones, will be a decisive factor. The Intel initiative of building gigantic platforms of servers spread out all over the world, illustrates this new given. Intel is going to invest more than one billion dollars in the construction of computing platforms for the sole purpose of selling raw computer power. A market that will be worth 15 billion dollars in 2003, according to Forrester Research, and which is contested amongst Intel, IBM and EDS, already owners of large computing

24 OECD, Perspectives 1997, Vonortas et Safioleas 1996, page 64

centers. The Intel On Line Service division (IOLS), contrary to other competitors, will supply only power and applications. Obviously, everyone expects to see IOLS to jump into e-commerce, but also into externalized banking activities, which represent a myriad of potential meta networks. There will not doubt be platforms of this type in the virtual schools of the future.

3. The multiplication of collaborative work arrangements among users of different companies will require the use of software components that facilitate data and information sharing, but also increase the demand for increasingly sophisticated tools for remote collaborative work. By incorporating high-performance and standardized – yet parameterable – organizational models, professional modules favor the productivity of group work: integrated software packages become "ready-to-use" organizational tools.
4. The incorporation of knowledge into electronic resources. Companies with significant means of production, knowledge processing and marketing will incite other companies to join their networks in order to gain in hyperproductivity. These networks will specialize, in order to cover entire sectors of activity. They will have artificial intelligence applications to self-manage themselves and meta search engines to pick up on the "undertones" of the vast databases built by companies for all sorts of activities. Applications will range from market analysis to the automated surveillance of their competitors to personalized customer relations.

The question is knowing which orientation these companies will favor, between the combinatorial of a professional community and the integration of a systems work, and between strong collaboration and strong integration.

3.3. The installation rate of NICTs is not the only factor of competitiveness

Technological power has become a major economic vehicle. It has also become an instrument of the competition among nations. In the United States, over 9 million people are employed by the advanced technology industry, and many peripheral jobs have also been created. But technological inflation doesn't necessarily guarantee competitiveness. In 1997, realizing how far they had fallen behind their American counterparts, Japanese companies launched a campaign called "one employee, one computer." The periodical Nikkei Zero[25] asked whether the initiative was a success. The response was that it was a total failure[26]. Nevertheless, with 8 million microcomputers sold in 1995, and 10 million in 1996, the Japanese buy four times the amount of technical equipment than the French. The Americans, with 850 dollars per inhabitant, invest eight times more than the global average[27].

But is the installation rate of technological power a good basis for comparison? The calculations of the department of economic and statistical analyses of the Science, Technology and Industry division of the OECD[28], compare the expenses incurred for NICTs and the characteristics of the growth in supply and demand for information technology in

25 The equivalent of *01Iinformatique* in France

26 Courrier International (March 19, 1997

27 Les Echos (January 1 and October 9, 1997)

28 Mr Kazuyuki Motohashi, STI (Science Tecnology Industry, OECD, n. 20), pages 17-18.

member countries. Already in the Eighties, when the diffusion of NICTs continued steadily, investment growth slowed in all the countries, decreasing even in countries like France and the United States. Between 1985 and 1995, the global market saw the first structural change with the relative reduction of material goods and the increase of software and services. The global market share rose from 46.6% to 52.1%. But this increase was essentially attributed to software (rising from 13.5% to 18.4% during this period). The second change was due to the increase in online personal computers: the shares for communications equipment rose from 3% to 4.5%, while big systems and minicomputers decreased from 30% to 13% of the total information technologies market. The effects of the networking of thousands of little machines began to surface, but the inertia was considerable, and the return to enormous investments was a long time coming.

One study shows that in the United States, where information technology investments were really taking off, the increase in returns of the manufacturing sector slowed between 1995 and 1999[29]. In France, a study conducted by the Pierre Audouin Conseil firm, and INSEE (national institute of statistics and economic studies) data published in the weekly magazine *Le Monde Informatique* dated September 19, 1999, once again confirmed that work productivity does not increase with information technology expenditures. A trend report issued by the French Ministry of Economic and Financial Affairs notes that, despite the constant development of technical investments, there was a steady downturn in productivity gains. In reality, they weren't looking at this from the right angle. Global productivity has grown considerably. The per labor force participant GDP hasn't stopped growing, but wealth creation is no longer linked directly to the amount of work, nor to the amount of machine investment, but rather to organizational innovation. If you look at the example of the banking sector, which has been by far the heaviest investor in terms of NICT, you'll realize that it still didn't succeed in becoming more profitable or competitive because it didn't properly restructure its organizations. Only the invention of Teletel, strongly encouraged by public authorities, allowed the banking sector to demonstrate its initiative for creating new types of distribution. For some banks, the slow migration of banking services towards the Internet illustrates how difficult it is for this sector to call itself into question and invent new forms of organization.

The amount of information technology investments alone isn't enough to judge their pertinence. Michaël Skok, distributor of groupware products, remarked, "*over the last decade, American companies have spent 800 billion dollars on information technology and bought 60 millions PCs. During this time, administrative productivity grew at a rate of less than 1% a year*[30]." Business Week suggests the figure of 1000 billion dollars invested over a period of ten years, just to realize that productivity gains remained insignificant, that these investments killed jobs and that information technology hardly demonstrated its profitability. A dangerous combination that actually results from the weakness of the organizational reorganization project. Without even a minimum of imaginative spirit to conceive new forms of organization, companies will not survive very easily. Attempting to boost a company through technical investments will only make things worse if it doesn't have an innovative, visible and legitimate organizational plan. *It's inventing new ways of using investments that makes the big difference.*

29 http://faculty-web.at.nwu.edu/economics/gordon

30 01 Informatique, (October 15, 1993)

Throughout these studies on the yo-yo effect of technological investments it quickly becomes obvious that the direct relationship between the growth of computing power and the growth of the GDP, or unemployment, is still not very significant. For lack of clear alternatives, company executives have played the computing power card, in order to gain competitiveness. By doing this, they committed the opposite error of those who thought that the growing number of computers was directly related to the growth of unemployment: there is no direct relationship between the number of computers a company possesses and its capacity to create wealth. It is becoming increasingly obvious that this relationship should be sought in the number of interconnections among computers, in the capacity of corporate or social cultures to exchange ideas and knowledge, and in a company's capacity to build partnerships. In other words, the economic development of a company, like that of a country, depends on its capacity to favor the creation of combined added value (which better utilizes its intangible investments) and global productivity gains (which optimize trade flows among interdependent organizations). This is the key to the extraordinary vitality of American growth.

3.4. Technological over-investment has diverted our attention from our future organizations

For lack of visibility in their organizational plans, companies will rarely profit from their technological voluntarism. Each reinvents the company of the future without ever taking a look at the whole picture of the organizational model. The dispersal of administrative services and the lack of internal coordination increases the costs of quality, which can reach 20% of administrative costs. The NICTs resulted in productivity gains but these were limited to compartmentalized, Taylorian settings. An executive at a large bank summed it up in his own way when he remarked, *"that the billions injected into networks of computers still haven't allowed his team to improve communication among all the different departments."* The need of companies for "knowledge-intensive" employees increased administrative and salary costs, which quickly ate up the slender gains obtained. On the balance sheet, payroll expenses and information technology budget are parallel[31]. Once again, it becomes obvious, sometimes too late, that technological contributions are limited by the weakness of organizational contributions. "*We know how to manage organizations. We know how to manage technology. We do not know how to manage the interaction between the two*[32]*,"* says Bruno Latour, analyzing the compartmentalization of the disciplines of science, technology and corporate management in an interview with *Les Echos* in October 1992.

Technological intensity alone is not enough to make a difference. Japan's technological intensity is much superior than other regions of the triad, but that doesn't make it any easier for it to preserve its economic leadership. Similarly, in France the weight of investments in certain sectors like banking has not been synonymous with productivity gains or strategic advantages over others. Why? Because an organizational deficit existed. Konosuke

31 Ettighoffer, L'entreprise virtuelle et les nouveaux modes de travail, (Odile Jacob, 1992).

32 Bruno Latour, researcher at the center for innovation sociology, professor at the *Ecole des Mines* and at the University of California San Diego, author of Aramis ou l'amour des techniques, (Editons de la Découverte, October 1992).

Matsushita, founder and president of Matsushita, said that western organizations were still fundamentally Taylorian, hence their weakness in conceiving new different organizations. According to him, this weak inventiveness depended on the fact that we copy organizational models, some imported from Japan, after having been zealous copycats of the Taylor and Ford models.

Our companies and organizations, even when very well-equipped with technologies, are still conceived and built according to old models. The concept of the combination of technological power and the control of mass markets is still a major theme in industrial strategies. That hasn't stopped Japan – and other nations – from continuing their downward spiral because they weren't capable of renewing the organization of their conglomerations, by questioning their approach to hierarchy and work flexibility. The slender results observed in terms of productivity, competitive differentiation and innovation, notably in online services, was a result of the deficit in the organizational innovation that enabled NICTs. Today, the intensity of technological investment, on behalf of companies and their countries, still doesn't always pay off, for lack of any real innovations in organizational planning.

This headlong pursuit of technology does not result in significant economic performances, because it relies on a concept of technological performance instead of organizational efficiency. Except for a few visionary executives, IT strategy didn't involve turning technological advantage into organizational advantage. There is a good reason for this. The methods of introducing technologies into companies were revealing of the management methods of the time: solutions imposed from up above, rarely participatory, with no quest for organizational added value. By dint of putting the cart before the horse, companies lost a lot of time waking up to innovation, while in the work world there was a negative idea going around about the predatory role of these techniques. Which slowed their intelligent application in work organization.

Faced with this technological competition, politicians and business managers find it difficult to bridge the gap between the technological world, political policy and strategic vision. By taking technology off the hands of technicians alone, politicians are faced with difficult decisions – from recycling nuclear waste to the use of Internet in schools – which force them to not only manage future problems but anticipate them as well. But can they really know what organizations and social services will really be like twenty years down the road? Similarly, can today's executives really imagine what their companies will be like under the influence of information and communication technologies in the next ten to fifteen years?

In the future, the challenge won't be having the most computers and technologies – these will be easily accessible to the entire planet – it'll be the quality of organizations, their overall efficiency, that determines the difference between companies and nations. An objective that won't be reached through technological investments alone, although they will remain indispensable – which will result in a number of even more problematical inconveniences since they put companies and nations at a disadvantage.

4. The information technology crisis: innovation slowed by the fear of technologies

This metamorphosis of economies submerged in telecommunications, like tectonics and plate tectonics, is coming up against a considerable opposition group, firmly set in its ways and traditions. It is also meeting with – and this is a new development – people's general feelings of mistrust towards progress and technology. The positive aura of technology has dimmed. Technological progress no longer sells; people fear it. Claiming more or less good reasons, people reject it or slow its prgress. It is often the rich countries, whose citizens and elite resist this flood more or less consciously, that fear it. A latent "technological crisis" exists in the West, which could result in the loss of opportunities for its companies, if not a downright loss for its economy and employment. Between "technophobia" and "technophile", company managers and public authorities will have to keep us from losing our capacities for organizational innovation. To do this, they'll have to work on the technological culture, and study its impact on the organizations that condition our collective capacity to project ourselves into the future, hence modify it or adapt to it.

In 1985, Japan, the world leader in advanced technology, made no bones about criticizing the West. Professor Yoshi Tsurimi commented, *"[that] American executives are technologically illiterate and search for legal and financial solutions instead of technological and human ones*[33]." A few months later, in 1986, the Massachusetts Institute of Technology issued a no-holds-barred report on America's shortcomings in the area of technological development that made quite a lasting impression[34]. When the MIT report came out, American executives were accused of not knowing how to manage technology in the face of the Japanese assault. The accusation revealed how poorly organized the country was to promote technology. The inadequacy of technical training in schools, and the lack of major technology project isolated American companies in the face of the flood of competitors arriving to face off in the biggest market in the world.

At the time, the question wasn't about whether America was lacking in innovations and know-how. It had these. The problem was that it did not possess the mechanisms that would add value to its immense pool of intangible capital, to transform it into business and move from research to marketing. It was no longer about conducting a protectionist policy, since imports of finished goods continued to grow[35]. The country needed to favor the diffusion of science and technology applications within companies and governmental bodies.

As a result of these revelations, in the 1990's the Clinton administration spurred the National Information Infrastructure (NII) program. To the utter surprise of the Europeans, the political leaders of the most liberal country in the world considered financing electronic highways and high-speed trains with public funds. The federal government favored, through significant tax incentives, the installation of crosscutting organizations aimed at facilitating cooperative business, so that the market would take over from American policy. When George Bush arrived at the White House, policy makers came up with the idea that the development of

33 "La Révolution de l'intelligence", Sciences et Techniques, 1985 special edition

34 "Made in America", Les Echos, supplement (Inter-Editions, October 31, 1990).

35 Robert Reich, "L'Economie Mondialisée", (Dunod, Paris, 1993).

information technology applications was just as important as economic policy. Since then, the United States has kept up the initiative. Al Gore, the former Vice President, was given the challenge of restoring America's image of science and technology. The recent nomination of a science and technology advisor to the White House, John Gibbons, shows that this policy of promoting the use of information technologies is still in force, a policy that is still rather exceptional in Europe. Europe, which closely follows its American precursors, also recently refocused its attention on the applications of these technologies to improve social welfare and the competitiveness of its companies[36].

4.1. Western society begins to fear information technology

While countries are using it as lever to gain a competitive advantage conducive to their businesses, the citizens of the richest countries in the world are questioning the negative impacts of progress and information technologies. A widespread sense of urgency and danger is taking over. The general feeling is that everything is moving much too fast. Technology creates unemployment. It is the source of all these nasty systems problems. Technology is the enemy! The philosopher Alain Touraine remarked "we no long believe that science and technology progress leads to social and human progress[37]." "*Technology works against employment,"* adds Jean-Jacques Salomon in an article published in *Expansion,* in June 1993. "*Should we torch computers?"* asks an article in *Challenges*[38], in which the author wonders if the eight hundred billion French francs invested in information technology over the last twelve years in France haven't helped, especially to reduce unemployment. And to charm its established customer base, in 1997 the American company Sun launched an extensive advertising campaign with the themes "*rejection of technopollution"* and "*technological overdose."* In short, the "*society and the technology empire are divorcing due to irreconcilable differences,*" according to Roger Lesgards[39]. All these negative mindsets, not necessarily inexact but sometimes biased and very hyped, are the consequence of an orthodoxy that limits, or curbs, innovation. This conservatism affects the business world. It limits the majority of initiatives proposed by executives, entrepreneurs or managers of public administrations.

This criticism is reinforced by the incapacity of managers to build a future on the foundation of their century's technological changes. Worse, public policy relinquishes all the power of technology to the technocrats, this new kind of clerk, at the risk of leaving all its citizens' legitimate concerns unanswered. Around 60% of the persons interviewed believed that science and technology had a "very significant" or "pretty significant" impact on their jobs. To the extent that between 1972 and 1989, surveys showed that the number of people who were worried that technological progress would increase unemployment rose from 69% to 75%. The divorce between the general public and technological progress is so profound, and the debate so crucial, that in 1999, at a global conference on science in Budapest, UNESCO proposed "*to draw up a new contract between science and society*."

36 Michel Catinat, "Entrer dans la Société de l'Information", Futuribles, May 1999.

37 L'Express, special 40th anniversary issue

38 Challenges, January 1993

39 Roger Lesgards (ex-president of the *Cité des Sciences et des Techniques), "*L'empire des Techniques", preface, Point Sciences.

Moreover, the diffusion of NICTs is revealing much bigger challenges than the fear of technology, because it challenges the unsteady equilibrium of existing organizations. Computers and their applications symbolize, to the point of caricaturing, the fear of a society in the face of the impacts of technological progress on companies, and consequently the work world. The example of computers perfectly symbolizes the duality of our attitudes towards the advances in science and technology. On one hand, the growing popularity of computers proves that people are becoming familiar with computers, which are thus losing their mysterious aspect[40]. On the other hand, their image will be more closely associated with the threat of unemployment. Both employees and executives face the threat of professional downgrading. According to a Gallup poll, half of all American white-collar workers fear what the future of information technology has in store for them.

As if to side with those who say "*wait and see*", the losers of the great technology game continue to make the headlines: the SNCF (the French railroad giant) in Paris, with its Socrate reservation system; the cancellation of the London Stock Exchange Taurus project, after 10 years of wasted effort and 5.5 million dollars evaporated into thin air; the interruption of AT&T telecommunications in the New York area in 1990 resulting from a few lines of defective program lines; the crash of the air navigation system at a Paris airport in November 1991[41]; the crash of the Sligos mainframe, which paralyzed a part of the French ATM card network one June weekend in 1993; the failure in 1994 of the London emergency call system, which resulted in the deaths of several people; in 1996, the interruption of the AOL online service for 6.2 million subscribers following a simple manipulation error on behalf of a maintenance team. The news often reminds us that we have entered a new age, the age of systems and their supposed fragility. It is frightening, and exploited by societies that feed on the intellectual terrorism they exert on the public and on opinion leaders.

4.2. The essentially productivist use of NICTs bridges the credibility gap

People distrust technology even more because the opportunities it offers have often been the source of reductions in payroll expenditures, as an increasing number of people have been laid off. The workforce has diminished as tied up capital stock increases. The relentlessness of seeing in technology only the potential for work productivity has occasioned serious disappointments for systems and senior managements.

Yet the majority of companies – 60 to 80% according to a survey in a 1995 edition of the French periodical *Monde Informatique* – are still insensitive to the foreseeable destabilization of their organizations. To them, NICTs remain, above all, a way to yield returns through work productivity gains, rather than a way to create extra added value. These are the companies that

40 Louis Chauvel, "La peur des technologies, dynamique des attitudes et opinions à l'égard des NTI", 1993.

41 A brutal air-controller strike erupted one Thursday evening in November 1991. As if by chance, in the next 24 hours, 14 of the 20 computerized control sites were out of service, including the indispensable operations room charged with preparing the flight plans for the Orly and Roissy airports.

will suffer most from job destruction[42]. A company's whose only concern is work productivity will succumb more easily to the low cost of production in certain countries than a company capable of producing added value. This simplistic vision of value creation through IT-generated cost reduction alone slows investments in organizational innovation, in news ways of creating wealth. Three specific factors have curbed innovation in a majority of companies:

- Widespread neo-Taylorism, tinted with a utilitarianist facade, significantly hinders any kind of original initiative. Executives more often "interpret" the contributions of NICTs as task-automating rather than value or quality adding for their organizations. Their only excuse is that they find it difficult to evaluate returns on investment according to the criteria of classic economic models.
- The conflict between the supporters of the theory of "deskilling" employees and the unemployment generated by NICTs, and the supporters of the compensatory mechanism of upgrading workers. Nobody could win. But corporate support and training costs have grown rapidly, in such proportions that all NICT investments have actually spread out over (re)organization costs.
- The existence of a more or less political, more or less opportunist technophobia. In his book "*La porte du changement s'ouvre de l'intérieur"*[43]*,* Jacques Chaize tells a little anecdote that very well illustrates the problem. A camcorder was being used to improve the ergonomics of a workstation in a production unit. The camera served as a means of analysis to adjust the cutting station. When some visitors arrived, they frowned when the employee concerned showed them the camera. Why? The same type of initiative in their factory had almost caused a strike. The employees accused the management of wanting to spy on their workstations in order to penalize overly slow workers. In short, sometimes the culture of the participants determines the fate of technology; certain presuppositions can lead people to spontaneously reject its introduction.

We should add here that with all these reflections on the means of cooperation, on global challenges and on high performance systems, employees systematically feel deceived by all this obscure intellectual talk, even though they are the key to a company's success. Overall gains in productivity are not due only to technology investments but to a series of organizational solutions based on the capacity of humans to work together. All we we can say is that the idea didn't come from management. Also, as promising as technological advances are, there must be a minimum of consensus and training investments. Our social patterns have been the number one reason behind the failure to introduce NICTs into our organizations.

4.3. Our cultural patterns condition our understanding of NICT applications

Our cultural patterns have become so important that they condition our understanding of technology and the ways we use it. For the time traveler that is modern man, it now becomes necessary to predict the consequences of an invisible world, branded as intangible or virtual, and subject to laws that are beyond his comprehension, which don't correspond to anything in the known world. For example, our relationship to time and space has been turned completely

42 "Le travail au XXIe siècle," Voir, (Paris, Dunod, 1995).

43 Calman-Levy 1994

upside down over these last few decades by the advent of computer networks. Today we can hardly imagine the problems workers in the Fifties faced when phoning or traveling. The first thing that strikes travelers are the different rhythms of the economic process in different countries. Our western society of impatience would find it pretty hard to readapt to past ways of living and working.

Cultural barriers, especially in technology applications, are often the source of misunderstandings among nations. Take the example of the French engineer of an oil company who for a long time couldn't understand his Filipino counterparts' resistance towards installing generator units. He was concerned with fire protection, but the Filipinos, subject to monsoonal downpours, were more concerned with flood protection. Technology development policies were founded on the models of development of the industrialized countries. Many engineers, even with the best of intentions, thought that by using the technological know-how of western countries, they could help developing countries advance even faster. This didn't work because the organizational models of western engineers weren't suited to the cultural and social characteristics of these countries. People in France don't speak about information technology in the same way they do in Bangladesh. Everyone understands the overall costs of an organization in a developing country are not anaylzed with the same criteria as in the West. Each region reacts very differently according to its economic and cultural context, its value system. This is true at the society level and the corporate level.

Specialists agree that computer-assisted collaborative work applications (groupware) are more successful in northern Europe than in the South. In an interview for the French weekly *01 Informatique*[44], Glover Ferguson, global co-manager at Arthur Andersen Consulting, pointed out the disparity existing between the North and the South of the European continent. In the face of executives' indecision about investing in the new forms of electronic commerce, he fears the arrival in Europe of American companies, which will rely on local partnerships – following in the footsteps of Amazon.com and AOL – to rapidly position themselves in a domestic market. He also points out that the excessive theorization (of e-commerce) at the expense of a practical, concrete approach to the use of information technologies, limits the acceptance and familiarization rates of their applications.

All of the innovations submitted to companies are the result of a medley of ideas, know-how, experience and technology transfers that have one common denominator: they all result from the brainwork of a growing number of individuals working together. The globalization of science and technology exchanges generally creates affinities that favor relationships among societies immersed in a same dominant culture: western. When an innovation is merely the product of a technology breakdown, or an answer to a new need, where it came from becomes secondary. But when it has a significant organizational impact, the contrary is true. If, moreover, this innovation impacts the process of interdependence among foreign organizations, the risk of maximum resistance develops. Whatever the supposed economic advantages may be, the social tribe feels threatened.

44 01 Informatique, October 1, 1999

4.4. The diffusion of technology depends more on socio-cultural patterns than on economic ones

If we suppose that information and communication technologies are the resources of organizational innovation, then they belong to a cultural heritage whose appropriation will be conditional upon a process of technological familiarization. This will involve building this heritage within companies, and trying not to confine it to the sole janglings of technocrats. In the early Nineties, when Vinton G. Cerf[45] had to prepare a presentation about the Internet for a convention, he sent a message over the Usenet, asking users what the network meant to them and how it could be more useful. In just a few hours, he received dozens of answers. It wasn't up to the technicians to say what the network should do, but up to the users to indicate what it did for them, what they got out of it. In a sense, each gave a vision of a better organization in terms of business, communications, and personal or professional exchanges.

In keeping their technological objects from users, instead of allowing them to explore their different applications, technlogists have played a role in limiting organizational inventiveness. No wonder! They know nothing, or very little, about the professions and organizations of future IT and telecommunications users. To make matters worse, applications have remained in an economic field that had to justify the increase in tied up capital (NICTs) through the speculative reduction of mobilized personal capital (jobs). An absurd situation that the managers of the Scribe[46] project, of the French Ministry of Finance, had to handle when it moved to Bercy in the mid-Eighties. In exchange for the billions of French francs invested in information technology, they had to gain a comparative amount in payroll expenditures. One can only imagine the impact of this discussion on the employees and labor unions. Since nobody, including the managers, had any real liberty to revise the organization, the whole thing went no further a prudent exchange of gobbledygook.

Though they sometimes condition our ways of living and working, technological objects still contribute to the development and transformation of non-technological fields. Science and technology continually shaking up established laws and mentalities. There are no two ways about it, the invasion of a given technology and its possible future depends on the cultural level of the environment it's proposed in. The mushrooming of technology in the United States and Europe doesn't fit into one, homogeneous model. In 1998, it was Chinese-American and migrant families who owned the majority (53%) of computers connected to the Internet, used to communicate with family members spread out all over the world. The average fell to 11% for American households overall. In short, interpreting this phenomenon requires a minimum of caution and is conditional upon understanding the geographic economics of each country's culture. A recent study conducted by Motorola England

45 Co-founder of the Internet, chairman of the 'Internet Society

46 In the end, over a period of four years, 6 billion francs were in invested in the 1986 Scribe computer automation project of the French Ministry of Finances.

demonstrates that the English are not very keen on NICTs. One Brit in ten surfs the web. And the market is barely developing: in 1997, 41% used no NICT compared to 43% in 1996[47]. Even in the United States, the Internet is not as popular as it may seem: 46% of the persons interviewed by Price Waterhouse do not want to be connected to the World Wide Web and 17% have no opinion[48].

We have identified three types of diffusion, of which the most difficult to manage is the one that affects management organization the most, to the extent of destroying it if the resistance to change is too strong.

Technological innovations incorporated into already well-known equipment, which upgrade its characteristics and fields of application. Their diffusion is conventional and relatively slow. The occupational sectors in question handle the diffusion themselves, as they get more economic (productivity), functional (greater possibilities) or operational (operating flexibility, maintenance reduction, etc.) advantages out of it. The transfer of applications and technologies to other occupational sectors depends on the manufacturers' promotional policies and on specialized relays.

- Innovation in new equipment to respond to a certain need that has yet to be ironed out. The impact on organization is minimal, the social advantage obvious. Diffusion is generally rapid. The diffusion of cell phones proceeded at lightning speed because it responded to a social need rather than an economic one. This is also true of microcomputers and the Internet, which take up just as much space in social and domestic activities as they do in professional settings.
- Technological innovations incorporating an organizational model. The impact on an organization may be greater, and the economic advantage for a company obvious, but instead of representing an advantage it can be socially detrimental. The diffusion of office automation in the Seventies and Eighties is a good example of this problem. No matter how good the technological innovation and its potential applications are, the social resistance of entire occupational sectors can considerably limit its diffusion or even block it entirely.

The majority of the problems that today's managers face result from the management of the third technology dissemination mode. Today, introducing technology is proposed as a way to resolve complex organizational problems. The dilemma is that technology dissemination can only work when investments in training are significantly increased. This investment will be proportional to the age of the employees and the estimated impact this change will have on the organization's traditions. This consumes a lot of "employee time", which must be reduced if you don't want to see your company disappear (unless you get around the problem by creating an altogether different organization).

Consequently, we are witnessing the acceleration of a process of activities destruction, which is further accentuated by the fact that the persons concerned resist all organization-intensive technological innovation. Thanks to virtualization, new business models are cropping up all over the place, which helps get around this problem by reinventing new forms of organization rather than renewing existing ones.

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47 Observatoire Européen des Technologies de Communication, (October 29, 1997).

48 Informatique Magazine, October 1997, page 17.

5. Conclusion: organizational deficit is the number one cause of loss of competitiveness

Companies have engaged in complicated reorganizations, especially since the first problem encountered involves the obstinate attachment of many executives to obsolete models. NICTs are the cause of considerable breakdowns. They profoundly destabilize traditional points of reference, even though executives often instinctively hold on to the lessons of the past. Because we haven't adapted our reflexes, we don't use their technological potential in a satisfactory manner.

A number of executives seriously underestimate the organizational upheavals caused by the dissemination of information technologies. Most can't stand the idea of questioning themselves. Though he had never even dreamed of buying a computer for himself, the owner of a large bank obstinately maintained that he encouraged his employees to get hooked up. The idea that his attitude wouldn't really induce his managers to make the leap, made this otherwise courteous man very angry. The failures of the first two attempts to install an Intranet in one of the largest global communication companies in the world were the result of the company's inability to accept all-out communication. The Intranet was reserved for members of the international staff – who incidentally weren't inclined at all to use it. Management considers the idea of explicitly suggesting this as downright insulting.

Too many companies have entered the 21st century with an organizational deficit that could cause some very serious consequences. Sometimes it takes technology years to reveal the areas where it will be most influential, and what new applications it will inspire. In short, innovation doesn't necessarily lie in technology but more often in what we do with it, sometimes entirely neglecting its original purpose. This is a point of view recently expressed by the winner of the Nobel Prize for Physics, Cohen-Tannoudji, when recalling the lack of application ideas that had followed the first discoveries of the laser beam. Today, CD-Rom drives, plastic surgery and advanced research in radiation therapy illustrate the way some humans have taken hold of technology to give it some meaning and positive uses.

We are witnessing the integration of knowledge into all of the intelligent fields, including new products and services. Why shouldn't organizations be a part of this? This is so true, that IT applications are incorporating a growing number of organizational innovations resulting from the pluridisciplinary experience of entire occupational sectors. Modeling a myriad of different functions blurs the distinction between tool and organization. Companies now purchase competitive advantages rather than technologies.

5.1. The organizational innovations resulting from reengineering have remained marginal

Many executives have admitted to not understanding a thing about computers, but aren't really worried about it. Why should they be surprised today that they don't understand them, when they bailed out of systems management because they thought it was too complex and hard to control?

Systems management is not handled in the same way as other departments. Who dares to say, "we neglected it because it bored everybody," especially since it required skills so far from their own. Some have wisely understood that this subject had to mobilize them completely. The president of Sollac, a company held up as model for its applications of Lotus Notes, explains "*Today, the president of a company must be directly involved in two key activities: quality and computer information systems*[49]*."* This issue is becoming even more sensitive as companies are overwhelmed by technological inflation, to such an extent that they can only deal with problems of a quantitative nature or problems in computer fleet management. It's educational to hear an executive at an American company remark that *"French companies may have excellent employees, but it's the quality of American organizations that makes the big difference now".*

This misunderstanding of the role of NICTs in the radical reform of corporate economic and organizational models was one of the causes of the relative failure of reengineering. The latter, which proposed a totally new look at corporations and their organizations, was the victim of an often-tactless overexposure in the media. In the mid Eighties-early Nineties, a tough recession and, for managers, the cult of short-term profits progression, paved the way for the fierce and unequaled notoriety of the arrival of reengineering. If some companies were successful at thoroughly reviewing their organizations, the havoc and social consequences of some operations, poorly conducted and at times intended to artificially increase a company's market value, undermined the proposed renovation process[50]. Confined within a socially predatory and economically controversial act, reengineering operations reached only an insignificant fringe of the corporate fabric.

For lack of any real conceptual advances in terms of organization, the innovations due to reengineering have remained marginal because they most often served to optimize the existing organization. Information technology was content to cling to classic procedures, which it improved under the guise of process reengineering. Michael Hammer and James Champy, authors of "*Reengineering the Corporation*[51]", tell the story of a team at IBM Credit that was wondering why a financing application took between six to fourteen days to process. So they decided to follow an application around. The team started a file and followed it from department to department. All they asked was for each employee involved in the process to immediately do his or her part of the work. When it was done, they noticed that the total processing time of the file was only ninety minutes. The duration of the process represented the time needed to transmit the file among the different departments, which, incidentally, were already automated[52].

All over, reengineering operations mostly made it possible to drastically reduce the number of workers needed to supply a service or carry out any type of task. William Bridges relates how Ford realized that its purchasing department employed four hundred people while Mazda's only had five. According to the Wall Street Journal[53], the radical overhaul of working

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49 "Les grands patrons français découvrent l'informatique", *Les Echos*, (September 13, 1995).

50 PepsiCo decided to split its different activities in the beverage industry in order to better clarify its strategy in the face of its shareholders. They didn't necessarily become more performing in the process.

51 Hammer and Champy, Reengineering the Corporation, (Harper Collins, 1993)

52 William Bridges, "*La conquête du Travail*," Village Mondial, (Paris, 1995), page 39.

processes could represent "the loss of 1 to 2.5 million out of a total 25 million jobs." In Europe, even if downsizing is not always the aim, the widespread overhaul of working processes due to information technology would make it possible to free up several million extra jobs a year. Talk like this only feeds the fear of technology kept alive by technophobic writers Rifkin[54].

It's not surprising that the majority of employees still fear this technological monster. In reality, in the mid-Nineties reengineering, like mergers and restructuring programs, were but the meager epi-phenomena of the great race for organizational innovation made possible by the virtualization of corporations. The real show was elsewhere, in the new inventiveness sprouting out of companies that formed alliances and merged together to form meta organizations. In this extraordinary proliferation of original and imaginative organizations, the 21st century company is on its way to inventing itself, by tossing out all the traditional parameters for measuring productivity and value creation.

5.2. Organizational maladjustment limits competitiveness

The dissemination of systems automation has not reached full speed. Yet, many companies are still not in a position to defend their capacity to create wealth because they no longer have the best organizations to remain competitive. We used to think, a bit naively no doubt, that it was enough to reduce the cost of our equipment to resolve the price/performance problem. But we had too quickly forgotten that we had to renew the organizations that go with it. Until now, the upsurges due to technology innovation have been absorbed more or less satisfactorily. But this absorption capacity is shrinking. Companies need to conduct quality controls on the impacts of technologies on their organizations. By sweeping the heirs of Fayol[55] and the rationalization of support services under the carpet, computer experts did not succeed in inventing the applications that went with the computers. Whether inflicted or desired, the diffusion of NICTs no longer escapes speculations on the impact they will have. If we have to invent the life that goes with it, we might as well invent the organization that goes with it, too: applications.

The cross-fertilization of organizational ideas that caught hold of America at the end of the Eighties played a big role in the success of its companies. The concepts of *benchmarking*, *downsizing*, *empowerment*, *excellence*, *reengineering* and the new *visioning*, along with the creation of dream teams to invent companies over the next ten to twenty years, all contribute to the general feeling that we're no longer in a "wait-and-see" mode. In the early Nineties, the press here in France, and abroad, showed a strong interest in the concept of the virtual corporation, demonstrating the importance attached to organizational innovation. If we don't invest in new organizational models, we'll run the risk in the long-term of having new models

53 Al-Ehrbar, "Reengineering Gives Firms Efficiency," The Wall Street Journal, (March 16, 1993), cited by Bridges, page 41.

54 Jeremy Rifkin, "*La fin du travail,"* La Découverte, (Paris, 1996).

55 French consultant who after World War II founded one of the first industrial organization consultancy firms based on American methods.

imposed on us by the rest of the world, notably the United States. Without necessarily understanding the keys to its success (you just have to read the American press to realize how perplexed its best economic analysts are about what's happening), today the United States is in a dominant position in terms of new concepts of wealth creation and the creation of new economic models.

Europe's competitiveness is threatened, not because it lacks the means but because it lacks imagination in the use of information and communication technologies. Guillaume Franck[56] sums up the problem in one phrase: speaking of the studies he had done on American management, he remarked, "*Americans thought our executives were sophisticated and intellectually superior as individuals. But theirs actually contrast the sophistication and superior efficiency of their companies*[57]." In response, Arie de Geus[58], who reminds us that the average life span of a company is thirteen years, maintained that the life span of a company depended on its capacity to continually question its organization. Whereas only 30% of Fortune 500 companies make it through fifteen years of changes in their sectors and markets, he shows, through in-depth studies of dozens of companies, that those who survive are in a continuous cycle of learning and adapting. They do what is needed to adapt to their environments. Like living beings, companies must be in a phase of continuous learning and transformation. This can only happen if they know how to anticipate future evolutions while relying on past experiences. All executives should memorize this quote from Albert Einstein: "*I'm interested in the future because that's where I'm going to spend the rest of my life.*"

5.3. There is a new process of hastening the destruction and creation of organizations

With identical organic structures, unemployment would no doubt continue to rise. Between 1990 and 1992, the end of the cold war forced the drastic downsizing of hundreds US companies, and the layoff of thousands of servicemen and federal employees, which represented more than two and a half times the number of employees affected by the downsizings at IBM, GM, AT&T and Sears Roebuck put together[59]. Employees were laid off anywhere productivity gained over payroll and administrative expenditures. The process of destroying/creating jobs jumped on the progress bandwagon and the cycle sped up. This was the first visible symptom of the fundamental changes occurring within the corporations entering the 21st century, the network age. This acceleration of the creation/destruction cycle was due to the rapid depletion of know-how and to the increasingly ephemeral character of production/consumption in narrow, though global, markets. The design/marketing phases went nuts. Our companies were operating on a "marketing minute" plan and, searching for high-performance solutions, went hyperproductive and virtualized.

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56 Guillaume Franck, professor at HEC (Hautes Etudes Commerciales) in Paris, author of A la conquête du marché Américain , (Odile Jacob, 1997).

57 Pascale-Marie Deschamps, "Ce qu'un patron français apprend au-delà de l'Atlantique,"Expansion, (November 5, 1997).

58 Teacher at the London School of Economics, "La pérennité des entreprises," Maxima-Institut du Management EDF, (1997).

59 Williams Bridge ibid

The virtualization of organizations favored the access to incredible accumulations of productivity while providing new ways to render electronic commerce services solvent. Production went global; twenty-one countries were participating in the production of a Peugeot cycle. It was the musical chairs game from hell. All it took was one link in the chain that knew how to produce or put a together a product less expensively in another country, and the whole factory would change nationality. Regardless of the labor cost drivers, the future economic nightmare lurked behind the fact that organizations had not fully adapted to the virtualization of the economy, and in the low expectations of sectors that continued to automate to excess, to a point where they could almost operate without humans. Like modern factories, entire business lines became hyperproductive by eliminating these "clumsy" complex processes. All of this accelerated the job creation/destruction process. In the summer of 1993, the Bureau of Labor Statistics announced that the chances of an employee finding another job were 4 to 1. These were the most alarmist statistics on the job market since 1982. Of course they were merely the official numbers; with the continual establishment of new organizations, the actual ratio was 7 out of 10 (jobs permanently eliminated).

Only internal re-training, or a very progressive organization renewal plan, allowed companies to absorb the shock and avoid an outburst of social unrest[60]. Companies became increasingly inventive in creating cleverer processes and more flexible organizations to limit damages. By mobilizing its workforce, Schneider Electric, which owned 14 production sites in France, improved its overall productivity to such an extent that certain activities, which by then had become more competitive, were transferred to Asia. All the know-how of its employees focused on improving the organization of production, to the point of reducing the cost of some products, like contact switches, by 30%[61]. The rationalization of the industrial tool, the specialization of certain work units and the reorganization of customer relations: everything was in place to renew the organizations and face the turn of the century in the best conditions possible.

But the renovation of the existing systems was not enough. Faced with the changes in work methods and wealth creation, we have every right to fear the incapacity of certain nations to create conditions favorable to the renovation and fertilization of the new types of competitive companies we're talking about in this book. We might as well say it here: the countries that have always had a popular culture of entrepreneurship will be better positioned to cash in on the processes in progress. The nations that encourage and support an administrative economy, and a proletariat wage-earning class rather than the development of the corporate spirit, will suffer more than they realize. By becoming instruments of wealth creation rather than a place where employees come to work, companies will, upon going virtual, make an increasingly economical use of the "workforce". The creation of activities and new professions will exceed job creation. Nobody seems to have understood this yet!

60 Jeremy Rifkin, "La fin du travail," La Découverte, 1996.

61 Les Echos, Tuesday April 16, 1996, performance issue

5.4. Organizational innovation becomes the engine of economic growth

For a long time, the supremacy of technology over organization limited the amount of inventiveness needed for companies to adapt. Having a good product or service is no longer enough; companies must also have an organization adapted to the new economic models made possible by electronic networks. It's quickly becoming obvious that this inventiveness will have growing consequences on their economic performance. Today the real factor in competitive differentiation is built-in organizational intelligence. To such an extent that the stock market regularly flares up to pay tribute to the most outstanding innovations.

The company of the dawn of the 21st century is nothing like today's. New chains of added value are forming across the fallen borders of the traditional organizations that are now only symbols of the past. The modern corporation, having entered the network age, is discovering new ways of organizing wealth creation. Its assets are no longer judged on the basis of the capitalization of its assets, IT investments included, but by its capacity to create wealth by working in unison with various economic players. The general idea of intangible economy is no longer just about improving work productivity, but multiplying the ratio of per job added value.

The surprising thing is that the much-envied success of the United States, following a robust consumption of technology, worries economists, who fear a break in the cycle of this consumption, even though there are still immense needs to fill. One of the reasons for the brazen prosperity of the United States, and certain companies, can be found in their extraordinary capacity to produce organizational innovation. Not only to become more responsive and flexible but also simpler, and thus less costly in terms of operations and heavy investments. A savings in resources owed to the virtualization of organizations. This recent phenomenon, aided by the cross between intangible and NICT, embodied by the development of artifacts that cover the planet, has created immense possibilities to invent new economic models.

In this "no man's land", which transforms the post-industrial society into an economic and social laboratory, the best-informed communities and the most imaginative individuals will profit from NICTs by fundamentally transforming themselves. To sum up, technology innovation alone is no longer enough to make a difference if it isn't combined with an organizational innovation or added value-intensive application. The difficulty lies in the fact that the bigger a company is the harder it is to implement any kind of technology innovation that includes significant organizational innovation. But the advantage is that all technology innovations associated with an organizational innovation that could be useful to users or clients are rapidly adopted and increase the value of an economic model rewarded by the market. As a result you reduce the size of your company and invent a new economic model to gain strategic differentiation.

Throughout this book we'll show you that the differentiation among companies will depend on the comparative inventiveness of how they organize their value chain, their business models. A process of renewing the economic fabric, owed to the increasing virtualization of the economy and its activities, is fundamentally challenging the organization models designed in the mid-20th century.

II. VIRTUALIZATION: A FACTOR OF STRATEGIC CHANGE

"I'm all for progress,
it's change I'm opposed to."

Mark Twain

The best known structural changes, and the most traditional, come from mergers or from the reorganization of large companies. As they improve their economies of scale and results in their work area become more visible, their stock and share values increase. ITT is an example of a split. The company separated its industrial activities from its other interests: insurance, hotels, casinos and sports, in order to give a more attractive profile on the stock exchange. In 1998, the total volume of company acquisitions and mergers came to 2,500 billion dollars, as opposed to 1,600 billion in 1997 and only 500 billion in 1990. That goes to show how important these changes are for the economy, but they're not the only ones. Today, on Wall Street, the amount of stock exchange transactions pertaining to the creation of new business designs competes with the biggest restructuring operations.

New organizational innovations create value and they have become so important that any intelligent initiative is welcomed by the financial market. In June 1999, the Californian software company, Ariba, entered the stock market with one share going for $23. In just a few hours it rose to $90, more than a 300% increase. That goes to show what kind of importance the financial world places on clever, new economic models. Instead of having users pay for the software license, they set a price according to the customer's real use. Ariba bills the customer based on the annual number of teletransactions done on their system. In less than three years, this young company has attracted some big customers like Federal Express, Visa, Cisco, Philips, Hewlett Packard. In mid-1999, Ariba was valued at 3 billion dollars with a turnover of 16 million, thanks to its directors who knew how to innovate within an economical and organizational model that was new and original. The model puts Neteconomy in first position, hence the virtualization of its activities.

At the end of the 20th century, high-tech companies generated 1,800 billion dollars. What's new is that it's no longer in the hands of a few bankers. The money is distributed to a large public and to the partners in these companies. High-tech companies represent about 20% to 25% of the capitalization of the North American stock exchange. They were at the origin of the strongest value creation on the exchange because, according to the office Mercer Management Consulting who studied the phenomenon, these companies knew how to develop themselves using the concepts of innovating companies[62].

The introduction of electronic networks into the added value chain not only upsets production and commercial structures, but it makes it necessary to totally rethink the company's structures and organizations in order to create new company models that will in turn create

62 A study by Mercer Management Consulting that followed the evolution of 900 American companies on the stock market from 1991 to 1997. *Les Echos,* December 8, 1998.

value. The most competitive ones intelligently distribute the jobs to be done using the policy of subsidiarity whenever it's necessary and possible. They can be recognized because they limit their perimeter of activity, working with well-targeted customers, and strategically controlling and innovating to create value with original and imaginative business models. The phenomenon is not historically new, but under the influence of virtualization, made possible by telecommunications, it has spread to the majority of companies. Virtualization is becoming the major factor of strategic change for business models.

1. Organizational innovation: the key to competitiveness

History has always given the competitive advantage to companies and nations that knew how to organize themselves according to the times. The Empire of Charles Quint was a model for decentralized organization as Caesar's was for his armies. Vespasian created a model to run Rome, Suleiman the Magnificent used trade to build the Turkish Empire all throughout Asia, (much larger than Charlemagne's Empire). Napoleon made the French administration what it is today and Bismarck began the industrial revolution in Germany. History repeats itself. It's organization that leads to success. It's stratification of organization that leads to failure.

When the Japanese knocked down the American market belonging to the three American industrial giants, General Motors, Ford and Chrysler, it was their manufacturing organization that made the difference (on time, autonomy and task flexibility)[63]. Since then, between 1993 and 1997, Japan has gone from 2nd to 9th place in terms of world competition, according to the International Institute of Management. The reason for this setback was caused by problems that came from the type of organization structures called *keiretsu*, or conglomerates. The Japanese legal system put restrictions on companies who in turn became conglomerates that mushroomed as they gave priority to in-house financial solidarity. The advantages of these horizontally working, decentralized structures cover up a lack of financial flexibility for managing the different portfolios. Japanese leaders knew that they were losing in competitiveness because, as opposed to foreign companies, they had no freedom of movement. They couldn't split or merge like foreign groups could, and they couldn't expand their perimeter of investment activity by creating new jobs. In other words, outside of all structural models, they lacked malleability, and combinatorial ability to optimize the use of their resources and their intangible capital. At the end of 1999, a law finally freed them, giving them the same possibilities as western companies. Soon it will be the Japanese countries' turn to experience the "big bang" in their organization as predicted by Peter Drucker, and they will be back in the competitive arena thanks to the improved quality of their organizations.

For a long time, organization was neglected. It was supposed to just follow flight plans that were imposed on the structure. Company heads decided to work strategically according to market changes but didn't think about the consequences on their in-house organization.

63 At the end of the 90s, a study from the Harvard Business School showed that Japanese manufacturers were sure to have a competitive advantage because their organizations broke down the walls between jobs and departments within the company.

Today's business models are forcing them to look closer. The 21st century has too many electronic business failures to count. All because of weak logistics. NICTs can give a competitive advantage to companies, but not alone. They have to be used as a strategic lever that takes into account all of the changes in organizational work brought by the electronic network century.

Technology can help organizations develop, but contrary to Clausewitz's theory; a defender has the advantage when fighting on his own territory, it's the attacker – the one who takes the initiative – who often wins. It's almost positive that he will catch his opponent off guard by changing the rules. Even though the mastery of technology is still essential, it is far better to lose the leadership than it is to lose a geo-strategic position due to an organizational deficit.

1.1. The circulation of capital penalizes the quality of the organizations and its executives

In their book, The Profit Zone,[64] Adrian Slywotzky and David Morrison tell the story about the US company Thermo Electron and its founder, George Hatsopoulos. It shows how important it is to act on company structures in order to create value. The company was founded in Massachusetts in the fifties and its stock value started to decline in 1982, followed by the start of a recession and a drop in the company's profits. The reasoning in terms of their part of the market was not critical at this point, the profits just weren't there. The director was quick to see that he needed to rethink and change the organizational business model of the company. There were 17,000 employees who, over the years, had diversified their activities to the point that it became a conglomerate, from lasers to cosmetics to pollution detectors, and its commercial vocation was no longer clear to customers, nor its profits for the shareholders. George Hatsopolous reorganized and expanded the company's entire portfolio, restructuring it into as many branches as there were areas of profit. It made a cluster of about ten companies. In the nineties, Thermo Electron was able to benefit from new information technology that allowed it to reduce its cost of transactions. When Thermo Electron voluntarily downsized and rerouted resources and jobs in the value chain, it created a business model that was better tuned to its customers and especially better adapted to the era. Between 1982 and 1990, the company's stock value climbed from 60 million dollars with a turnover of 240 million dollars, to 8 billion dollars with a turnover of about 3 billion dollars.

About 2,000 billion dollars are exchanged over financial networks daily, that's equivalent to the French annual GDP. The cyber economy fever boosts stock and exchange values. Most transactions don't reflect the financial needs of the economic players but their need to speculate on the quality of a certain stock certificate or on a particular currency, on a company or on an innovative team[65] that has an attractive business model to offer. Contrary to what used to happen, a cyber company's value is not based on tangible or intangible values but on its ability to quickly generate a turnover in proportion to the number of customers. The owners' fortunes depend on the number of pages looked at on Yahoo or the number of micro-transactions that an on-line trader handles.

64 Adrian Slywotzky and David Morrison, vice-presidents for Mercer Management Consulting, *The Profit Zone,* Times Books, 1998.

65 Apple's stock certificate has lost value as its directors have left.

The trick is to get into the powerful cycle of growing returns. Virtual companies are also, by definition, very interested in expanding their commercial impact through partnerships that enlarge their customer bank. That's why they've become a stronghold in the financial area. The new rules for the game that they made were assimilated with company value increases. The most wonderful industrial tool won't get a second look from investors if it doesn't have products and added value services that are in line with neteconomy.

The foremost economic models that are in demand always couple the use of information and communication technologies with organizational change. Their results on the NASDAQ in 1999 just goes to show the new way of thinking. Viant Corp., consultants for electronic business, dropped 49% between June and July 1999. Fashionmall.com, who developed electronic sales for on-line fashion , dropped 46% between April and July 1999. On the other hand, Priceline.com, who invented a new organization for electronic business using auctions , went up 487% between March and July of the same year. The building of specific communities also allows for large global production benefits and explains the success of Healtheon (up 969% in six months) or of VerticalNet (up 380% during the same period). The stock market is glad to have these companies because it uses their networks to invent within the new organizational and economic business models. The business models are constantly being called into question and their ability to adapt companies to the neteconomy has become the Achilles' tendon for investors.

1.2. Creating value by speculating on the structures of corporations is a recent fact

According to Mergerstat, the German branch of the investment bank Houlihan Lokey Howard Zukin, the average merger for the first trimester in 1999 counted 4,326 restructuring operations that cost 714.5 billion dollars, as opposed to 3,831 operations during the same period in 1998 that cost 773.1 billion dollars. Business mergers generate movement on the stock exchange and that's what management likes: capital gains on the stock exchange after having cleaned house.

The most spectacular mergers are the talk of the economic news. Exxon and Mobil weigh in together heavier than the French national budget. Citicorp-Travelers (financial) and SBC-Ameritech (telecom) are two of the mega mergers in 1998. Total became partners with Elf, following in the footsteps of BP-Amoco for the oil companies, then Chrysler with Daimler and Renault with Nissan for the automotive companies, and the Deutsche Bank with the Banker Trust just to mention a few. It makes you wonder what the motivations are behind these monstrous mergers. We know how difficult it is to efficiently manage such giant companies, often weakened by enormous expenses needed for reorganization (remember the recent indigestion that Compaq had after swallowing Digital Equipment). The size-race is on and is looking for economies of scale that will win a part of the largest world market ever. In spite of all the usual fiscal tricks, the external growth through mergers is extremely expensive, because of the excessive financing needed to run an overly ambitious portfolio, and because of people, after all, the new organization needs rationalization.

How can we forget the inconveniences of mergers? Value creation is essentially due to the downsizing of the number of employees if a turnover didn't shoot up after the merge happened. When Total and Elf joined together, the stock exchange value went down, a hypothesis that stock observers used to evaluate the merging of the BNP and the Société

Générale. These partnerships seem to go against the history of downsizing (the average size for US companies has gone down about 20%)[66]. But does it always pay to "eat" others? This question was asked by the French financial weekly, *L'Expansion* in May 1990, who observed a series of acquisitions: The US company ANC by Pechiney, the Belgian Société Générale by Suez, Nabisco-Europe by BSN, Penwalt by Elf, the company La Victoire by UAP, Rorer by Rhône-Poulenc, UTA airlines by Air France, etc. The Banque de France was eager to answer the question and after having studied a sample of more than 5,000 companies, it concluded that their return on economics and finances were higher than for others…provided the companies stayed within their own work area and that they auto-financed the association. According to strategy consultants, although the critical size boundary for each industry varies, if there is too much change in size or diversification of portfolio activity, the company will be handicapped. This is especially true when the company uses intense cerebral activities and *hard* organization is not sufficient as a framework for individuals who alone could be virtual companies, even if only temporarily, in order to be free of traditional constraints.

After the mergers, another way to create added value is…to split. ITT did it and ATT followed, splitting into three branches. The downsizing and the refocusing of its work activities were quite beneficial. In 1996, ATT weighed 75 billion dollars. Barely a year later, when ATT split from NCR and Lucent, the group was up to 159 billion dollars. A spectacular profit that illustrates how financial markets want to be able to see results from companies' organizations. The stockholders give pats on the back to the companies that make an effort to let the public know how their business models are working and this in turn gives companies more strategic flexibility. Jean Estin, the former president of the European branch of Mercer Management Consulting, wrote an article called "M&A: What's the point?"[67], and he puts his finger on the fact that branch activities, such as the clothing industry, are unable to generate value through specialization, but through the renewal of value chains. In this area, as in many others, it's the use of computer networks that makes the links possible. A team from McKinsey in New York and Boston made a list of the most important performance improvements that came from this kind of restructuring, and they all felt that organizational innovation was the key to value creation[68].

Here and there, people are starting to worry about the huge growth that comes from these operations and the risk of monopolization that the gigantic structures could cause. An association between industries could net whole sections of the economic market. We can't help mentioning the association between Elf and Total that counts for 25% of gas sold at the pumps in France. It's not very much compared to over 50% sold by the chain superstores, although their capital value is less. Meta networks generate profits thus boosting associations and restructuring in areas like the food industry. Wal-Mart has a large part of the market and this has caused its competitors to group themselves together. Business chains have become nationally stronger and as they tackle foreign markets, they either take the place of local competition who is incapable of matching their performance[69] (Wal-Mart for the US and Asda for Great Britain), or they become associates with the competition and come in gently to the foreign country (The French Casino with the Brazilian CBD).

66 Michel Drancourt, « World Company », *Futuribles*, n° 242.

67 *L'Expansion Management Review*, June 1999, page 44 and on.

68 Patricia L. Anslinger, Steven Klepper and Somu Subraniam, McKinsey Company, *L'Expansion Management Review*, September 1999.

But, and we'll pick up on this again later, the real danger comes from the oligopolistic character found in some areas of activity that are directly influenced by telecommunications. To paraphrase the economic press, the new "masters of the world" will be the "masters of the net."

2. Vitualization becomes a key factor of competitiveness

Two company directors out of five in the world believe that they will have to virtualize their company by 2010. 52% believe that outsourcing is a key to success for their company. 36% believe that their success will depend on alliances and 57% through joint ventures [70].

In order to collaborate and not lose money, modern organizations have to concentrate their use of telecommunications. The development of added value products and services calls for more partnerships to be able to quickly enlarge markets and diversify manufacturing. Modern companies are characterized by close industrial, economical and social interdependency. They are virtual professional communities where ideas, values and skills are constantly in movement. They go way beyond the walls of traditional companies. In the beginning, virtual communities were considered a benefit for all scientific areas because they cut costs and allowed knowledge to be shared on a large scale network, hence new ideas developed through collaboration. By doing away with spatial and temporal restraints, telework will contribute to the increase in international collaboration and also to the growing need to communicate between the different think-tanks of the world.

Now that it's easy to keep in touch with all kinds of communities, worldwide inventiveness will develop and work groups in all areas will spring up. Today it's not unusual to see a scientific document signed by dozens of people. For example, when an article announced the discovery of the "quark t", 398 authors from 34 institutions in 5 countries were cited[71]. Actually, we're faced with a phenomenon of growing productivity due to the increasing number of partners who are able to share their ideas or solve a problem whenever they're needed. It's easy to guess the economic benefits for the companies who invest in applications networks. First, the networks serve to optimize the exchange of know-how and human resources, then it is used to develop virtual market communities, captive ones if possible.

Material costs become negligible in many areas of intangible economy, companies virtualize and take on roles according to their respective expertise, the same as scientific communities do. The productivity of their intangible investments is increased and they organize themselves into virtual communities benefiting from all that the cybereconomy can offer. Here we have a

69 In 1993, the rate of return for some of the competition in the food industry, such as Sansburry or Tesco in England, was two to three times higher than the large chains in France, thanks to the use of intensive computer exchanges. See the report *Le Commerce dans la société informatisée,* Institut du Commerce et de la Consommation.

70 Study *Vision 2002* lead by The Economist Intelligence Unit and Arthur Andersen Consulting in 1997 in 16 European countries, 13 countries from the Americas and 5 countries from the Asian Pacific.

71 OCDE, "Le Village Mondial de la Recherche", *STI* n°24, 1999, page 60.

logic of networks where material and intellectual resources are shared among the partners in a win-win strategy that includes (this is new) the customer. Two managers out of five that were interviewed predict that companies will have to virtualize in order to gain global efficiency, will have to reduce the cost of continuous change and will have to go from a logic of capital management to a logic of intangible capital management.

Companies aren't faced with a computerization problem but with a whole new way to create wealth. It's evident that they must take on an epistemological approach for the organization of their business, it's even urgent for those who are exposed to international competition.

2.1. Virtualization turns traditional economic models upside down

Tomorrow's company has its future in cybereconomy. The development of sales on the Internet benefits services and generic products available to a large customer bank because the net makes mass marketing cheaper. Companies can also offer specialized high value added services at reasonable prices since the Net makes customer targeting easier and allows for interactivity that used to be impossible. Faced with specialized and changing markets, and the need to improve their commercial returns, companies join to present their services that complement one another. The strategic difference will come from the originality of the organization and the combination of services that are offered. The consumer who doesn't like to zap for a long time and who wants to go straight to the point (sales on the Net is like compulsive buying: it has to go fast) will prefer the most attractive package deal.

In other words, the intrinsic quality of a service is less important than the ability to provide a comprehensive systemic service. Package sales are very important to stay competitive. An example is Lastminute.com who provides packages of homogenous vacation services. The more original, the better. The web site for La Boite à Outils (a do-it-yourself company) has pages offering advice with the possibility to exchange tips with other customers as well as the sales team. The sales reps made a photo gallery showing who they are, their ideas, the products they like the best, links to other handyman sites that they recommend, and a space with games and unusual "finds" for the handyman. In short, the customer surfs through faster and faster, and in order to catch his attention, the service has to be fun and complete with value added: credit, guarantees, payment security, delivery follow-up, extra service as original as possible. And to make things harder, all of this has to be constantly updated.

This was a real culture shock for the seventies who were not always very aware of what went on outside of their companies. Management recommendations conditioned directors' behavior[72]. Well-known business models were the rule. It's difficult for them to immerse themselves in the culture and cooperative business models of a network, in systemic services, in products and derived services[73], so many improbable and unfamiliar situations only a few years back.

72 We mean all directors, not only those from large companies.

73 When George Lucas undertook the making of the first episode of *Star Wars*, he accepted a relatively modest salary in order to get the funding necessary from big companies. However, he asked for 50% of the rights from derived merchandising. The results are that the trilogy brought in 4 and 5 billion dollars of derived products, that's four times the amount brought in from the box offices.

Virtual organizations are modifying the very nature of commerce. They allow new trade activities to be invented and change the ways we work and learn as they give us easy access to knowledge. Knowledge is a very precious intangible capital that countries and companies want to own as they try to attract the most intelligent people to create "brain poles" or think-tanks to create wealth. For most parts of the world, the key is to create clusters of specialized companies, or meta organizations, that reinforce the ability to attract and compete in economy.

2.2. The "virtual business model" as a new strategic turning point

In September 1999, First-e, the first pan-European on-line bank, opened its counters on the Internet. It offered a number of services to its customers thanks to agreements from its partners. It's a specific virtual economic organization that makes for a unique virtual business model, with several companies associated in its development. Banking services are furnished by the French discount bank, complementary services like mortgages, sales and management of mutual funds, insurance are all handled by the most competent independent companies that subcontract the work. Alin Wormer, the general director, says that the development strategy depends on two key factors: the returns on accounts and the variety of exterior services. This was the winning formula for the virtual bank Egg, who started a few months earlier than First-e. In six months, the bank had 500,000 customers.

A change in the flow direction has changed the rules for competition, with Dell selling microcomputers over the Internet using just-in-time methods. Payment is done before delivery and most computers are made-to-order and delivered within two weeks. Storage is reduced to just six days shelf-time. Power relationships between the economic players are turned upside down: music fans can now burn their own CD without the use of major record companies. Major companies react through the Net by testing new products with a limited circulation. Entry is easier for service providers, small companies and individuals offering their products directly, and if successful, they will be bought by a big company who will flood the international market. Conversion costs due to the loss of unfaithful customers are reduced thanks to the targeted appeals from *tracking* software. New kinds of profit for companies who instead of making customers pay for subscriptions, earn millions of cents as they count, penny after penny, the number of clicks on the ads on their Web pages. All of the strategic keys from the Porter or the McFerlan models are implied and put under pressure by e-businesses, by the invention of virtual interest communities. Electronic networks aren't satisfied to just transform value chains, like in the media where the audiovisual sector and the press[74] have to cohabit, but they help break the models. An example is the caricature of "free Internet", a factor of strategic change that's not due to a new service or a revolutionary product obviously superior in quality or in user value, but it's due to organizational innovations made possible by electronic networks.

74 Reuters makes more from on-line news sales than it does from sales to traditional media. In April 1999, Reuters New Media (RNM) had more than 7.2 visits with 130 million pages indexed from advertisements (Andrew Nibley, president of RNM *Le Monde Informatique*, July 9, 1999).

Although the optimization of methods and operations of an existing organization can allow for productivity gains, it's when we break away from conventional organization that we create value. It means inventing a new organization, new *virtual business models* with all that virtualization has to offer. The strategic lever is the ability to destabilize the existing model and replace it with a new one. Companies that didn't understand the importance of inventing their own new organization, set out too quickly in neteconomy only to be surprised by the rapid evolution of the economic models that they were using as a base.

On one hand we see an inventive development of products and systemic services (co-development, co-production, co-distribution…) that take advantage of the new possibilities created by networks, and especially by the Internet. On the other hand, we see a tremendous change in company structures that base their wealth creation on combined added value, value creation coming from several partners. From now on, cohesion and the ability to collaborate efficiently within a group of partners from different companies will be as important as the good in-house coordination of company activities.

2.3. The transformation of a traditional organization into a virtual corporation: Brun-Passot case study

Brun-Passot's paper mills were founded in Lyon in 1949. At first they specialized in paper transformation and then, in 1980, diversified in the manufacture of finished products, office supplies and equipment. In the beginning of the 1990s, the company delivered to 15,000 customer locations and commercialized 12,000 catalog products. The management of 10,000 daily orders was centralized and the turnover reached 160 million French francs.

As early as 1983, the Brun-Passot company launched a service called Bureautel that allowed customers to order via Minitel. Orders were secured, company statistics and financial reports were sent to customers' accounting departments. In 1988, 22% of all orders were placed using this new system. It was successful because it saved money for customers by reducing waiting periods and administrative costs. The catalog became electronic; query authorizations were adapted to the size and nature of purchases; customer file records were readily available when needed. The customer's investment in a Minitel was relatively small compared to the system's benefits: teletransactions were standardized between the different computer systems. This was the start of the B-to-B of the 90s, thanks to Internet this time. Brun-Passot was one of the first to use the X400 standard with Transpac (in 1985) followed by Numéris with the same service connecting computers along with the development of data exchange programs. In 1991, the company earned 254 million French francs, 40% came from electronic sales. The company continued to simplify its sales protocol and improved productivity, to the benefit of the customer. The cost of ordering protocol was reduced by 40%, storerooms were eliminated for office products, time was reduced from the time of order to delivery, and savings were made on general expenses. This drastically changed the value chain of the traditional sales procedure. The time cycle from purchase to delivery dropped from eight days to an average of one day; the cost of the transaction was divided by 10 and the average cost of the cycle went from 1,000 to 25 French francs.

At that time, Brun-Passot strategically changed its business and organizational model with the creation of Citius. A new company that not only handled sales for Brun-Passot, but using its e-business know-how, it handled other companies on the Internet. The CitiusNet platform

became indispensable, the savings were evident for each link of the chain. In 1996, 80% of French office equipment companies had joined CitiusNet. CitiusNet had antennas just about everywhere in Europe and the Americas. Brun-Passot started out as a product distribution network, becoming an added value information middleman with CitiusNet; the market was international; its results grew at the rate of the number of commercial subscribers and customers using the network. The intangible value of information available on the network could be superior to the material value of the equipment sold. CitiusNet had gained in global productivity and in the next few years it will gain in intelligence as it interprets the flow of information among the different users. The new owner of the company, an EDS operator, will oversee the new changes.

2.4. The advent of professional communities: individual multinationals

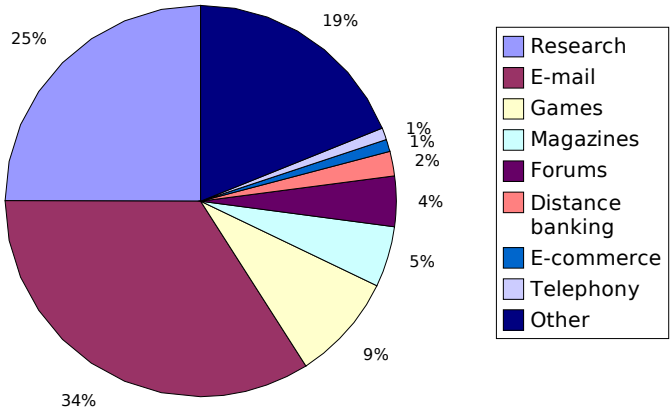
Widespread virtualization of intangible economy carries with it the unequalled easiness to share ideas and do business with individuals, small groups of individuals or companies. The Internet unites people and takes into account the smallest needs, that taken alone or in the usual customer catching context, would never have entered the world of economy. The phenomenon favors new virtual professional communities that couldn't have existed before, and gives them an incredible influential power[75]. Micro-activities develop and organize themselves on networks of communities where buyers and sellers constantly put their powers to the test around "a good price". All sorts of reasons are good for micro-transactions among cyber-businessmen, and they feel at home in the virtual community that shares their same ideas and values; bartering, mutual agreement sales, and shopping clubs.

Economic virtualization isn't content to just change what's already there, it lets new players come into the neteconomy. The development of B-to-B (business to business) trade exchanges surpasses the B-to-C (business to consumer) exchanges.[76] The ratio is about 20/80. But remember that B-to-B also means pre-existing exchange that now uses TCP/IP protocol on the Internet. And the 20% that's left is a source for the invention of new on-line services that will go beyond electronic catalog sales (see diagram 2-1).

Cooperative business gets less media coverage, but it's as important a factor in business development as electronic business is, as we can see in virtual communities pursuing various goals. Thousands of professional communities use more or less specialized networks with Usenet. Teleworkers, all kinds of specialists, and all sizes and kinds of economic branches multiply their exchanges to ten times those of electronic businesses. Small and large organizations and businesses consider the thousands of encounters as future links for neteconomy business.

75 Estée Lauder launched a collection of specific products for on-line sales and advice in the US in order to renew relationships with scattered customers. The data base held 500,000 names, 18% of which didn't know the products until the service was opened.

76 According to IDC, in the year 2002, inter-company trade will count for 340 billion dollars as compared to 85 for individuals (Frank Gens, president of IDC, during an IDC forum in 1998).



2-1. US use of the Internet (in %)

Source OTEC 1999

In less than a decade, several hundreds of millions of people will be organized to use electronic networks on a regular basis in order to insure their wealth or to use it to their advantage in special ways. Part of the population is demanding and trained to increasingly use extremely specialized applications and on-line services to do business.

The Internet is an economical way to sell services and products of low value. The commercial cost is so small that anyone can jump into the adventure to earn a few dollars. A new reservoir for wealth creation was born[77]. The Web lets all of us become service producers/suppliers. Already in the US one out of four families experience the small or home business adventure. The phenomenon will certainly grow. You open shop on the Net, find a hundred or so customers, create an activity and often your own job (self employment).

Individuals, alone or with associates, are going to increase their service offers to companies and families in order to protect their ability to earn money. The natural consequence of widespread virtualization will be the multiplication of family enterprises and individual multinational companies. It lets anyone offer service thanks to the power of electronic networks…and thanks to lots of shrewdness. NICTs will pull us out of anonymity into cyberspace where cosmopolitan electronic nomadism lets us talk and do business with millions of potential customers. This implies a growing number of people associating with others to launch on-line services that represent additional income sources.

The development of telebusiness on the Net gives place to methods of proactive marketing that maintain an interactive relationship with the customer. The relationship will develop through more intensive information sharing and in exchange, better service. Customer-

77 See Denis Ettighoffer, *E. Business Generation*, Village Mondial, Paris, 1999.

oriented service is now within the reach of all business structures, even the smallest company, because the Web allows made-to-measure services using standardized components in the commercial offer. For example, the brand Miki is a virtual catalog: the customer helps design the glasses he wants to buy or chooses the logo he wants on a T-shirt, or another company has the customer fill out a specific questionnaire before it recommends a panel of industrial cleaning products, a personalized package of products – that already exist.

A small virtual company will have no trouble keeping in touch with its customers, its professional community and information resources. These micro-units or micro-enterprises cooperate from one region to another and make up meta organizations that are quick to move in on projects or to join a team of companies. It's certain that traditional companies will increasingly call on these work units when needed because the cost will vary, unlike fixed expenses. However, because of this, company directors will probably limit hiring and encourage their employees to become self employed in their specialized fields.

It's a policy that has the advantages of being low-cost and of making it easier to manage human resources outside of the company. Virtual communities are reservoirs of intellectual resources and, through negotiation, they can be used in function of a company's needs. In the future, companies will encourage and finance these virtual professional communities not only to have the specific know-how available when needed but to do business.

3. Competitive disorganization

In coming years, organizations who survive extreme variations in operational activities will be simple, strong, adapting and quick to move, in order to keep strong combinatorial abilities. These combinations become complex, even more so because they are constantly changing. Companies invent new structures, new ways of organizing, intended for more specialized operations but capable of high productivity thanks to their respective interfaces. Moreover, because of the nature of virtual organization, they have great combinatorial flexibility to adapt their value chain to the problems they face, almost every hour.

Two engineers from IBM, Rolf Landauer and Charles Bennet, have been studying the question of energetic costs of information. They wondered if it would possible to make a computer that consumes little or no energy. They especially looked at the energy used during the time it takes for a computer to process information. In 1996, they came up with a theory that the scientific community loved, "…the quantity of energetic information needed to describe an unorganized object will be greater than that needed to describe an organized object." According to the principles of thermodynamics, any change in state of an observed object will be the source of energy consumption. Part of the consumed energy will be dissipated and the dissipation, in the case cited above, will be even greater when the description is longer because the observed system is disorganized.

Landauer's and Bennet's computer measured the "rate of organization" of an object or a set[78]. How can we describe this measurement? Charles Bennet puts it this way: "It's the time it takes to calculate the object's description." In other words, a set of organized objects costs less computer time and is thus less expensive to describe than a set of disorganized objects.

78 Roman Ikonicoff, "Et la vie émergea du chaos", *Sciences*, June 28, 1996 and *Science et Vie*, March 1997.

The more a system is organized, the less information it needs to use. The corollary of this is , the less it consumes, the simpler it is, even rudimentary. What we gain in energy, we lose in complexity, “in organizational depth” to say it in the engineers’ words. The natural procedure for the life of organization would be to naturally and very slowly advance in organizational logic in order to reduce energy consumption. The procedure reminds us of the ongoing productivity search within companies.

3.1. The” dissident” factor as a source of progress

Julius Rubek and his colleagues from MIT wanted to set up a procedure that imitated life, that would be capable of auto-correction and evolution in time. So they invented chemical molecules that could make mistakes. In management, we took care of that problem a long time ago: we use people. Their judgement errors, their prejudices, their lack of daring or their conformity that makes them imitate each other, all work towards the schumpeterien procedure of destruction/creation of a company’s life.

After all, it’s easier to invent and make a molecule that can infinitely reproduce another molecule than it is to create one that participates in the “organic creation” through differentiation. It’s remarkable to note that while researching for a way to get the dynamics of the experience going, the MIT team limited the ability to reproduce on part of the molecule so that it would mutate. They then studied the exogenous factors (the environment’s light, temperature, acidity or salinity) that play a role in chemical mutations in DNA molecules. By creating a “dissident” molecule, an interesting phenomenon appeared. Some of the new molecules that came from the mutations started competing with the original strain. They replied better and consumed all available energy for their own benefit, then they began to recombine to create still more new molecules. Recombination was more or less fertile depending on the environment (primeval soup…or the social-economic context) and the auto-compatibility among synthetic molecules. Chemistry began to help us understand the organization of life…but also the organization of companies. Organization constantly swings back and forth between the resistance to change with the desire to stay the same in order to save energy—risking the loss of ability to evolve—and the need for renewal after a change in environment, sometimes having to use a lot of energy—risking to perish in both situations. Other laws had to be found that would give additional meaning to the question: if good and bad decisions of a director help an organization evolve, where is the real breaking point, what is the dissident catalyst that forces the company to move? What’s the contrary of a recessive factor? A progressive factor!

Biology has already discovered troublemakers that create life. The geneticist, Richard Maxon, from the University of Oxford, discovered the H-influenza bacteria. This bacteria is programmed to constantly evolve. Its genetic sequences evolve hourly to make new protein in order to escape the immunological defenses of an organism. The continuous recombination of the H-influenza, and we know how the HIV virus evolves, makes it very difficult to use usual vaccines. It teaches us about the role of disorganization in the competition between the species…and about man in a disorganized environment.

What is it then that makes up the dynamics of evolution in organizations since systems also try to stabilize themselves in order to reduce energy output? Again, in the end, this leads to necrosis and their disappearance. Some researchers, like Stuart Kauffman[79], from the Santa Fe Institute, a Mecca for complexity research, give the role to man, the "good servant". According to many researchers, human life became probable because it was necessary in order to maintain the dynamics of life in general. In this hypothesis, man becomes the key factor to progress. While machine systems strengthen their ability to self-regulate flow and all kinds of problems, here comes man, dropped in as a "disorganizer", just the troublemaker needed to adapt organizations. It gives some zest to the story , the idea that we have about man's role as the master of changes in society in general and organizations in particular. A role that will have him inventing new kinds of enterprises in the century of networks and cybereconomy.

In our companies, the troublemaker never listens to personnel or gives them credit for their ideas, or flares what new markets are looking for. Do we have to remind you? Being in touch with the market is where two thirds of successful innovations begin because ideas are developed by or with customers[80]. The phenomenon is the same inside of a company: people are eager to suggest, sometimes even to propose major organizational innovations. Some companies that understood this before others have increased their number of *dream teams* and other think-tanks. Thought is a good teacher for all who participate in the process. It's good to have places set aside for conciliatory discussion and exchange, as well as *virtual workshops* in chat rooms on the company's intranet. Progress groups look towards ambitious horizons while they constantly try to imagine the future. Companies benefit from the good ideas put forth by the troublemakers, who, before anyone else, have the gift of detecting possible weaknesses of coming changes, so companies can anticipate problems. Change sometimes causes misunderstanding.

3.2. Unlikely economy and organizations

Who would have dreamed, just five years ago, that a little company like StarGig.com would offer free services to independent musicians in order to help them find an audience on the Internet. They then bought the web site Band Register.com and united more than 250,000 artists worldwide, creating a huge pool of up and coming talent. Now each musician can find his audience without having to go through middlemen before being heard—if ever—by the general public. Not so long ago, this was an improbable organization, now it's a model for a facet of neteconomy that disturbs economists. Qualified authorities speak about the "new economy" in conferences everywhere. They all agree that they haven't overlooked any new economic laws. Instead, they speak about a change in state of today's economy due to new information and communication technology. How can something be both the same yet different? Water and ice? Economy networks? Real yet virtual?

79 *At home in the Universe*, Oxford University Press.

80 Dr. Von Hippel from MIT, *Technologies et Sociétés*, Pierre Lévi, McKinsey.

Branches of industry that question their organization and then tackle drastic changes are the ones that have the best chances for growth. They don't look very much like the ones from the beginning of the century. And it's easy to imagine that companies of the future will go through even bigger fundamental changes. The question remains: how will they reinvent themselves to gain in strength and efficiency over the coming years?

Cyberspace is a new continent, a fantastic opportunity open to inventors of new ways to work, new forms of companies and new ways to create wealth. In the US, the Internet is already responsible for 9% of the GDP growth and for 22% of all capital gains on the stock market. Richard Christner, vice-president of Mercer Management Consulting observed that, "When Ford bought Volvo, it invested 6.5 billion dollars. At the same time, America On Line (AOL) bought the search engine Excite for 6.7 billion dollars." [81] An intangible economy is establishing itself alongside the traditional economy and it weighs as much, if not more, in companies' accounts and in the economy's balance. This is a new economy with its own specific rules. We haven't begun to measure the devastating effect it could have on organizations, especially the ones that are supposed to create wealth in the 21st century.

3.3. The infamous troublemakers

In the early fifties, the economy was dominated by big industries, symbols of national powers, centralizing, dominating, bureaucratic, personified by big charismatic bosses who had a strong influence on economy and politics. Industrial, political and financial powers mutually reinforced each other. Man was just a number, anonymous and doomed to stay in the work chain in the same company for his whole life. During those years, service industries and the number of white collar workers started to grow considerably. In the US, during the period 1960-1990, employment in production activities regressed from 25% to 16% of the active population although total employment doubled. Millions of white collar workers replaced blue collar workers in service jobs and progressively in value added service jobs. Thus, in France between 1960 and 1990, employment doubled for knowledgeable executives. In the year 2000, between 65% and 70% of the active population will work in service jobs, 40% of them will be symbol technicians[82].

Today, although only 2% of the active population works in agriculture, the United States is still the largest food producer on the planet. Simply because agriculture in the US is industrialized, benefiting from think-tanks and concentrating on the specialization of farms and their distribution network. The industries of the fifties, that grabbed just about anything that was within reach, followed almost the same model, stratifying whole sections of economic activity. Before, the economic world was only interested in the few thousand big companies that symbolized the power of a country.

One man upset the financial system and brought out into the open the misappropriations of the system. An employee at Drexel Burnham, Michael Milken, a financial genius, devoted himself to selling *junk bonds*, a term that really showed the establishment's contempt for small and medium sized companies. They were told they should see their bankers because the

81 "Oui, Internet crée de la valeur", *01 Informatique*, July 2, 1999.

82 Symbol technicians are the professionals that work with all forms of information (see Robert Reich, *L'Economie Mondialisée*, Paris, Dunod, 1993).

stock market wasn't made for them. Milken was able to get financial markets to invest in these smaller companies and industries, who were ready to pay the price to finance their development, because they could promise greater profits to shareholders than the well-established larger companies could. In spite of the personal misadventures of the instigators of the financial revolution that shattered deep-rooted traditions, shareholders knew that they had the right to demand financial returns, and that these wouldn't end up in banker's or director's pockets anymore. They'd fill their own pockets now. The result was that financial flows, mobilized for special funding, got into the habit of watching the small and medium sized companies, the start-ups, and the pocket-sized multinationals. Stronger with the help of financial backing, these small companies and family businesses could compete on the international market, multiplying license agreements, partnerships and "win-win" strategies in order to develop their businesses. This financial revolution was to become a primary factor for the renewal of US competitiveness.

It pulled the whole world into a frenzied change in organizations that succeeded one another over the last twenty years. Out of 100 leading companies listed in *Fortune* in 1956, 71 had disappeared by the beginning of the eighties. The new economic champions are found in service industries, especially services that depend on intellectual resources and networks. You can find these champions wherever there is an organizational inventor, an original business model.

3.4. The inventors of organizations

As in the example of Michael Milken in finance, whenever fundamental changes are seen in a company's organization, you'll find a person behind them who has a real vision of where the company's going. These are the guys who invented temporary work agencies, car rental agencies and made-to-order methods using components, after Michael Dell's example. In short, new ways to work and new business models. Percy Barnevik invented the matrix-like structure of ABB (Asea Brown Boveri), and although his successor, Göran Lindhal, is again transforming the structure[83], it has been considered a successful organizational model, like General Electric is today. In the beginning, Barnevik's idea was to cluster specialized small and medium-sized companies into networks according to their products in order to reduce production costs and benefit from economies of scale in their larger operations, all of which multiplied gains by six.

In the same manner, General Electric's impressive profit growth came from the reorganization of its activities' portfolio in 1986 when Jack Welch took over. The company's value shot up from 11 billion dollars in 1981 to 200 billion dollars in 1997. What we learn from the adventure is that Jack Welch, with his industrial experience, knew how to change General Electric through the development of value added services that really pay. He also knew how to encourage troublemakers within his company. He decided to promote those who undertook

83 The stock market is already worried. It doesn't like uncertainty and rarely lives calmly through these transformations.

important initiatives, even if they weren't successful or cost the company money. The Welch theory is that there are no risks involved when the chance of success is certain. A new generation of enterprising managers was born. They could move up the power ladder if they knew how to grasp opportunities in the ever-changing business world. From this point of view, Welch was first of all a fantastic "disorganizer" for established models.

In 1988, he introduced the *work out* that made employees and executives sit down to discuss problems. Any time a problem came up, a *work out* was set up and it required all concerned parties to be there, even the customers if necessary. The *work out* was finished only when a solution was found. Welch introduced several organizational innovations, and his obsession brought about the invention of a special team called the "audit staff". It was made up of two hundred twenty people of thirty different nationalities, with the average age under thirty, that spent time in all of the group's units, not to play the part of the boss's spies checking up on everyone, but to innovate within the organization, bringing fresh new ideas. Patrick Dupuis, GE's French director says, "At GE we trust each other."[84] In simple terms, the three company rules are: "Cut the red tape", "Be quick", "Be open". Lots of companies should adopt these rules.

Now Jack Welch has asked his organizational troublemakers to tackle the possibilities that Internet has to offer to the different groups of activity. A work group called *destroy your business.com* has the assignment to make groups react to the sudden emergence of the Internet in all parts of GE. The incredible job of reinvention is underway in the company, mixing ideas from all levels of the company's population. A *dream team*, dedicated to the NICTs and what they can bring to the company, has already set up an in-house platform to support new activity invention. It's like a virtual greenhouse for General Electric's partners, where they can bring in external innovations to be put into a business plan using all available resources.

Most consultants can tell if a new project will work just from meeting the company's director. They know if they're dealing with a conservative defender of the establishment, hiding behind words and ways that just won't work because they go against his true nature. These false troublemakers are really only managers using reengineering methods to re-look their organizations by downsizing, sometimes drastically cutting cost, but not creating wealth. Too many companies have paid the price with reduced productivity and a morbid future. True disorganizers create wealth and even make it a pleasure to work and to change.

When the visitor walks into the reception hall at the Oticon head office in Strandvegen, Copenhagen, he sees a transparent glass fireplace. There, strips of paper fall through the air from shredders. The symbol is very clear: this is a zero paper company! Oticon, 1,100 people, a turnover of 400 million French francs, the old Danish firm that was founded in 1904 is now the world leader for hearing aids. There's no doubt that Oticon owes its position to the organizational inventiveness of its president, Lars Kolind, who was 50 in 1997.

In 1991, Lars Kolind looked to the possibilities of the use of telecommunications and personal computers to organize the company's resources in a logic that limited the use of paper and favored cooperative work through the use of the company's intranet. All of the employees have personal computers at home. In order to stop departments from working in isolation from one another, each employee has three different functions, favoring multi-activity and skill-sharing. People are considered as living pools of resources, an in-house temporary work

84 *L'Expansion*, July 1997.

agency. Nobody belongs to a particular department, in fact, their desks are on wheels and they go to the work space where they are needed for the amount of time the assignment takes. Each project director mobilizes people according to his needs. It's an academic atmosphere; meetings are held in "discussion spaces" where note paper is banned. Laptops are preferred. Hours are not punched but the project's progress is what counts. The usual way of ranking was changed and a sponsorship kind of system was introduced. An employee chooses his "sponsor" among the managers who then consults his colleagues to grade the employee for an increase or decrease in salary. The results of Lars Kolind's innovations are telling; Oticon is growing, doubling its turnover, its position on the world market and has hired 500 people.

Every where in the world troublemakers who disrupt the established way of organization create wealth. They are very pragmatic and always use new information and communication technology whenever possible to disorganize long-standing systems. Sometimes they launch new products and services, even companies, that are considered totally crazy by the older established colleagues, using communication technology.

3.5. Unlikely corporations

The Linux story is a perfect example of how vast electronic networks are revolutionizing business. For most disbelieving company directors, the story comes under the heading of funny anecdotes, just like the Loch Ness monster, the zero defect, the "friendly" union and remarks like: "My gosh, what are they gonna come up with next to make me buy their stuff?"

Although the Linux adventure is well known, lots of people still don't believe that the software was invented by a lowly student with the help of hundreds of strangers on the Internet. There are lots of other examples that testify to the advent of a new economy, with none of yesterday's reference points. How would you have reacted five years ago if you were told that 10,000 independent micro-computers were networked on the Internet to try to crack one of the FBI's secret codes? It means that someone was able to convince thousands of little "computer ants", small organizations, to unite for a super-powerful calculation. The network gave such an incredible power to small organizations that it shook a pillar in the US security system.

Do you have any idea how many other unlikely stories are out there, that you just haven't heard about, and maybe never will? In Buenos Aires, in a small room in the chapel of Our Lady of Victory, there is a bartering fair where you can exchange goods for services. Some people who didn't have very much money formed an association in order to help each other, swapping small jobs, objects, and meals for other services. In 1996, more than one hundred thousand people were members of similar associations in other Argentinean cities. The movement also inspired companies to create a virtual compensation association,. Walter Gazza, a former company director, started the virtual organization for compensation, the CCA, for sales on the Internet. The seller is credited for the amount of merchandise or services that he is offering and his account is debited each time he uses a service or orders a product in exchange. Kosmet is a company for hygiene products that uses the organization for part of its products. The compensation system CCA makes it easier for economic activities with low value added to be marketed. Most of these products and services wouldn't have survived in a "normal" economy.

These stories aren't just anecdotes. Who would have bet on AOL's success or on its model of economy against the French Minitel less than ten years ago? Very few people believed in on-line services in the 1980s. The majority refused to believe in buying products and services at a distance. Back then, AOL was an unlikely corporation. In 1998, its profit was ten times the one in 1997. The model has to live and evolve, especially with new players coming in, changing the rules of the game, for instance with free Internet.

When the American Chris Kitze and the Frenchman, Laurent Massa invented Xoom.com, a site selling software for downloading, people thought they were crazy. Nothing like it had been seen before. The founders of Xoom.com made their fame by building a community of customers, the Buyer's-Club, and chat rooms. They adapted their offers to targeted communities and expanded their range of products (especially in the area for downloading music). The process took two years. Today, Xoom.com is the envy of many. In the single month of March 1999, the site had ten million hits. In 1998, the turnover was 8.3 million dollars. More than 25,000 subscriptions daily. There are 7 million user names in the customer file that came from personalized commercial offers, and its role as the middleman between the supplier and the customer is a prototype for unlikely corporations. Analysts predict that it will reach a turnover of 60 million dollars in the year 2000[85]. The turnover for a virtual store with a total area of zero square feet.

4. A fundamental change in the value creation logic

According to each branch of trade, a new arbitration is being established between tangible and intangible activities that enter into the cybereconomy. Every link of the traditional value chain takes on a new importance. Hot line and communication costs now outweigh production costs. Today, in agriculture, it's considered more important to master weather prediction than it is to invest in farm equipment. Powerful computers in the Weather Bureau collect and compare millions of parameters, and millions of dollars are invested in raw material based on predictions and precursory signs that help evaluate the evolution of agricultural production. In the clothing industry, priority over production mastery is given to the ability to anticipate needs and desires for the creation of several children's clothing collections yearly. Thanks to networks, the key factors to success can evolve.

Now economy develops according to two models that live together in two worlds that have their own logic. Remember the story about Carl Yeager's plane and the aerodynamic laws that effect different flight speeds. Today, activities are carried out in two worlds, a physical, tangible world of products like the telephone and a world of intangible services like buying over the telephone. Lots of companies simultaneously use both kinds of economy. The way to create wealth is not the same in the physical and virtual worlds. In the first, the service is a tangible object, in the second, the service has the added value of information included in the accepted price. The first one has value from the explicit use of the product, the second has value from the particular advantages that the product brings. Federal Express uses *tracking* for its packages, information that shows where an object is on the itinerary at any time. This is useful information for all customers. At Federal Express and UPS, as in other big rapid delivery companies, *tracking* is a specific service that makes a difference for customers.

85 *L'Expansion,* May 26, 1999.

The ingredients for added value are intangible because they are generated by information itself. The way to create wealth differs each time. The creation of a virtual bank doesn't imply that the rest of the network will have better profits. In the virtual, intangible universe, information alone is an added value. It can be a simple copy of the original information or be changed and intelligently incorporated into a product or service. Furthermore, an intangible value is inexhaustible, it never wears out, it can be renewed as often as we can imagine new information services that will be useful for targeted customers. The return on investments is improved through the better use of raw data collected by companies. It all goes to make for more appealing, relevant offers, that in turn improve the market value of their services.

Intelligence, or rather information, when incorporated in products and services, becomes more important than production. Tomorrow intelligence will probably mean the ability to do business with added value. The French firm Opiocolor draws, conceives and makes mosaics. Thanks to the Internet, customers become designers using the maker's drawings and ordering models according to their needs. A decoration library lets the future buyer-graphic creators-manipulate mosaic pieces, simulating the chosen model and individualizing it before placing an order from a distance. This organization has cut the waiting period by ten, from the design, to the estimate to the manufacture. Improvement in reactivity and lowered prices due to the automation of the chain of information divided Opiocolor's cost by five and allowed customer expansion[86].

A number of companies, especially service ones, don't understand the logic of creating wealth and haven't given their customers personalized service. Of course the customers left. This opens the door wide open to small, new competitors who are very specialized and ready to take on the big companies. The change has already modified the balance of power between the order-givers and their contractors. It benefits components manufacturers who knew how to develop horizontal partnerships in order to diversify their markets. It's even to the point that some of them have acquired the important know-how for giving orders, just like the product design consultant.

Because of these changes, there is a growing need to collaborate and integrate the different components of the global value chain. Depending on the case, we have gone from a pyramid relationship between the order-giver and his contractors, to a systemic relationship that subordinates the whole into a meta network. Sometimes, others organize themselves into meta companies in order to adapt to the growing phenomenon of susidiarity that is encouraged by virtuality.

4.1. The traditional corporation goes virtual to create value

Today, three out of ten big industrial corporations give at least half of their manufacturing to contractors[87]. Most of them had to change their relationship with their suppliers, their contractors. In 1996, the French Department of Industry carried out a study , *From subcontracting to partnership,* and found that in 37% of the cases, suppliers participate in product design. The same as companies try to find ways to mutualize running costs and capital expenditure among partners, they imagine that together they will be able to increase

86 Paul Moga, "Le Web dope les ventes", *Les Echos,* September 8, 1999.

87 Thomas Steward, "Welcome to the revolution", *Fortune,* December 13, 1993.

the value of their common discovery or set of skills that would be impossible to do alone. In other words, it's better to share key knowledge and make the most of it together: partners generate conjugated added value. When developing the Neon, Chrysler reduced the time of launching the model onto the market to 36 months and saved two thirds of the usual cost. Thanks to its network of contractors, a meta organization worked towards the same goal and Chrysler developed its new model for only 1.3 billion dollars, compared to 5 billion dollars for the rival, General Motors' Saturn.

In companies, the increase in number of tasks and also in the diversity of specific expertise needed makes it impossible to optimize in-house costs. It's now questionable whether a company should have a legal department if it's only used once a month, just as it's questionable whether a company should increase the number of computer services at the whim of changing operating languages and systems. A company can no longer reduce cost and make a profit all alone. Telecommunications networks will encourage the development of outsourcing for the following reasons:

- It brings out added value by sharing skills and expertise (law of growing returns).
- It uses the principle of subsidiary: buy elsewhere whatever your company can't make better or cheaper.
- Outsourcing to mutualize cost and favor economies of scale.
- Change from the logic of fixed expenses to fluctuating expenses: buy just-in-time, according to needs, including skills.
- Develop partnerships in order to change from a logic of cost to a logic of profit while modifying the economic basis of industry.

These thoughts, often intertwined, will first transform the heart of the industry, then new specific organizations will be invented, often horizontal to those already in place, and the economy will be boosted with the creation of activities and jobs. Above all, and not the least surprising, we see the development of meta organizations uniting numerous companies, both big and small, around a shared goal.

4.2. The virtual organization of Reuters

The Anglo-Saxon press describes Greg Garrison as an innovator who 'radically redefines the very nature of companies'. With over twenty years of experience in financial and information systems, he invented *the Usability Group* at Reuters, with specialists from consulting firms all over the world. Reuters' customers are active in various markets in more than 150 countries and they're confronted with very specific problems. In order to match the diverse needs, Reuters decided to set up a skills pool, available to customers using just-in-time logic. That's how *the Usability Group* came about. In the beginning, the plan was to hire several dozen specialists scattered around the world. However, the group had to cut costs and the original plan was stopped. Only two employees were hired. The group would have to work differently. The set up of the group of experts had to answer different needs, we could even say eclectic

needs. Greg Garrison asked the different consulting firms to designate the most competent specialist in each area of concern. While the project was getting under way, the notion of a virtual team used as a resource pool became a reality in *the Usability Group.* The goal was to attract experts from different firms and different countries to work on demand to solve problems.

Before the virtual team could work, the problems of intellectual ownership rights and confidentiality had to be solved. Since Reuters was financing the project, the contract gave it rights to the results, which contributed to the collective advancement of know-how. For Garrison, it was as if Reuters benefited from the advice of hundreds of experts, all backed by their own consulting firms. He made the most of the situation by putting concerned parties in relationship with their professional network through e-mail, and he could count on thousands of people's help just-in-time. In some cases, it gave access to rare and precious skills. In a way, Garrison set up a professional virtual community dedicated to the smooth running of his company.

In a traditional bureaucratic context, recruitment and organizational set up would have taken several years and there wouldn't have been any of the flexibility that virtual organization brings. He saved on office expenses, on administrative problems and on fixed expenses that are essentially in telecommunications: 92% of all transactions are non-verbal. Today, the virtual organization of *the Usability Group* allows the team to change with the wind, combining skills and know-how according to the problem at hand, and allowing projects to start or stop without second thoughts or guilty feelings.

However, the number of virtual groups is growing, creating complicated relationships for Reuters and its outside contributors. Sometimes consultants from rival firms were put together on the same project. The leadership of the teams had to be based on trust and be able to constantly adapt to particular needs at all times. Garrison believed that it was important to keep group size to ten or under and to carefully form the teams in order to maintain normal relationships. For Garrison, the strength of virtual organization lies in its ability to move quickly and be flexible. On the other hand, the organization should become the traditional base for members of the team to be able to relate to one another in Reuters' network of super-experts.

Traditional companies are slowly starting to cohabit with the professional nomads that virtually cross over entire continents. Today, even if it's not very widespread yet, an engineer can travel the world using professional networks, a little like journeymen used to.

4.3. The corporation goes virtual to reduce restructuring costs

With computer networks spreading, consultants and directors are faced with an unbelievable challenge to rethink of ways of organizing their company while putting the value chains back into the balance. But the real reason that they changed their way of approaching the organizational structures was the growing cost of reorganization. In fact, it's considered to be one of the most dangerous factors in reorganization because it can compromise the results for years to come. It becomes even more important when you realize that companies are buying more and more intangible products that are more ephemeral than active materials. Directors think twice before plunging ahead in reorganization because they realize that the cost of

restructuring an organization can be four or five times the operating cost. If they would just look at the figures of what the company spent over the last three years in comparison to the number of people directly concerned in the company, you can be sure that they wouldn't refuse to look closer at the idea of reducing the restructuring costs for their corporation. In virtual companies, the key to overall future productivity can no longer be found in the operating cost but in the restructuring cost.

The company who is in the midst of organizational renovation takes its toll of the multiple *stop and go* projects that set the pace for the difficult advancement of modernization. Just when projects start, they stop and every year the company picks up the same leftovers with new names and new project leaders. This doesn't help the reigning atmosphere nor the results.

Organizations become obsolete very quickly, and cost reduction for restructuring has become as important a problem as the reduction of operating cost. Companies are always in a hurry and under pressure, and as they enter the third millenium, they make the mistake of trying to save money on well-thought out organizational plans. One of the main goals for today's organizers is to virtualize companies in order to limit spending on constant adaptation to different structures that often come about from *stop and go* projects, and they want to limit negative effects that come from these projects.

It's not surprising then to see a growing number of companies turn to inventive new forms of organization that look like a better economic choice for competitiveness. It's less expensive for them to change their suppliers than it is to change their organization. Corporations no longer hesitate to go outside of their walls to save on the cost of organizational restructuring of poor in-house operations: they develop subsidiarity.

4.4. Subsidiarity: better to change a company's supplier than change its organization

Following the example of the automobile industry – PSA bought for 72.4% of its yearly turnover[88] - lots of big companies, not knowing how to act quickly within their own departments, went outside for flexibility, reducing their fixed expenses. Something that they couldn't do in-house. This encouraged the downsizing of departments and in part, outsourcing. During an in-house investigation about company expenses from 1980 to 1987, the Saint-Gobain company saw that their growth in productivity was already predominantly due to purchased services. In 1987, these purchases came out on top with 32% of the operating cost. In many companies, the tendency became stronger during the nineties. The part of purchases in the turnover for French companies went from 60% to 70% between 1990 and 1995.[89] From now on, the increase in productivity is earned by the ability to know how to buy services when needed or by associating with good partners. If a company can't impose in-house restructuring, it can keep its competitiveness through the use of contractors, increasing productivity that the company doesn't know how to or can't do alone. This comes from the fact that it's very difficult to invest a lot over a long period of time before benefiting from the performance in all areas of activity. There's still another constraint on modern companies, it has to protect its know-how through the use of the least expensive intangible capital possible, all while maintaining it with the least possible problems. The capital is held by other very

88 *La Lettre des Achats,* April 1997.

89 *Les Echos,* April 15, 1997.

specialized companies, which explains today's *"big bang"* in organization for virtual companies. In a traditional organization, if operations went wrong or if there was a lack of professionalism in one link of the value chain, the whole structure, in other words the whole company, would be in serious danger. In a virtual organization, the risk is limited: one faulty link will be replaced on the spot with another one of better quality. We don't need to make costly changes in organization, we can just change partners.

Usually when we talk about outsourcing, it means giving up some of the non-strategic jobs and buying services instead, for example, the management for purchases, salaries and personnel. In England, Tibbet & Britten, who specializes in fresh food transport for mass marketing, realized that the heart of their operations was perfect logistics. So the company diversified and offered to take over the transportation for other companies. Today, Tibbet & Britten deliver a third of all products from computers to clothing to cars. Outsourcing gave a big boost to their growth and profits.

Many companies now prefer to recruit free lancers from specialized outsourcing firms. These outsourcing organizations know work laws in detail, how to draw up the best contracts, insurance for personnel etc. They are highly specialized , simple, small, quick to move and they know their market very well. All of this gives them the ability to answer all kinds of particular needs within short periods of time. In Chicago, the M2 company is famous for its success in temporary executive recruitment for difficult assignments. In Paris, Monster.com has a file of several thousand specialists in numerous sectors. Companies that are organized in international networks can supply customers with the right person they need to work on a project or difficult assignment. More and more companies like this are on the market because knowledge and know-how is rapidly changing. In almost all areas, skills rapidly become obsolete. The only branches of industry that can keep up with the changes are those with specialized organization. Most companies, except for the core expertise, are pretty general in all of their peripheral activities. They have all to gain when they call on outsourcers: the company's know-how can be updated regularly from the transfer of skills and knowledge.

That's why future virtual companies will hire less permanent employees. The personnel will depend on professional community networks who work with specialized placement agencies that sell skills. They are capable of finding and furnishing rare skills. Créalog is a French company specialized in logistics. Réalix is another one, founded in 1991, that on demand, supplies highly skilled employees for the aeronautic and space industry. These new middlemen are progressively giving companies, who are open to outsourcing, a real skills network to complement their in-house teams of workers.

4.5. The formation of meta organizations

When companies put their means together, they immediately increase their chances of better returns on tangible and intangible capital, much better than if each one worked alone in their own corner of the market. Convergent engineering mobilizes the different partners' intelligence in order to reduce to a maximum the problems that might occur from costly flaws in production and after-sales service. It can't be done without the intensive use of networks and co-operative work tools. Distance work groups are becoming commonplace with millions of computers able to interconnect. That's how fifty companies were able to work together to

set up the new headquarters for the Paris city transport authority. The virtual company regrouped many trade associations who received data that was constantly up-dated by each participant. The *groupware base* included maps, instructions and co-ordination messages for the construction site. It could be used by dozens of specialists in function of the project's needs.

Through the development of intelligence "dispatching", shared and coordinated by *groupware* tools, we can start tapping the gigantic reservoir of global productivity of systems. If we improve the efficiency of interfaces between several organizations, the tools correspond to the collective needs of all partners either working together on the same assignment, launching a new product or a new service. We go from a logic of individual productivity to that of global productivity. That also means that the core of the *groupware* applications will not deal with the integration of operations in big companies but in the development of interprofessional (intercommunal) collaboration between small and medium sized companies and industries, all kinds of organizations. In the end, they will form company communities, meta organizations.

More and more companies are following the example of Reuters, and they are trying to organize themselves in clusters, sharing know-how and common goals. As they form professional meta organizations, they become a valuable source of collective intelligence for their customers. In the US there are networks of virtual lawyers that make it easier to help one another and to stay in contact with clients. In France, company communities unite accountant and consultant activities in more or less formal ways. The phenomenon is still at the embryonic stage, only 7% of all consulting firms are on network. But these companies have a turnover that represents 16% of all consulting turnovers. The amount grows to 33% for the accounting sector with only 8% of all firms on network. Micro-companies and micro-networks (less than ten partners), with some on international networks, cohabit .[90] The integration for this area of services is still very timid. It's usually limited to document sharing, quality control and transfers of methods and standards.

Co-branding and cooperative business between distant partners is no longer the exception. What is new in these kinds of meta organizations is the intricate working among the partners as each one takes on a specific role. A meta organization looks more like a symbiotic relationship than a sales/purchasing performance. Co-dependency can become very strong between the participants. That's a fundamental change. The covalent bond can be so strong between the economic actors, that the rupture would be mortal for both parties in case of separation. That's why it's so important for company directors to anticipate the systemic risks of their meta organization.

4.6. The development of outsourcing dramatically changes the job market

One day, the French director of the Crédit Agricole bank in Paris called a meeting of the operations committee where they were to receive the head director of IBM France. As he greeted his visitor, he dumbfounded the committee as he explained that Crédit Agricole had become one of the world's largest banks thanks to IBM's banking know-how. Having said

90 *Les Echos,* July 16, 1999.

this, he was only giving official recognition to the role that *big blue* plays in the modernization of numerous areas of activity: pharmaceutical laboratories, the steel industry, banks, temporary work agencies, the food and agricultural industry. When someone asked André Sarrazin , the president of the catalog order company La Redoute: "What do expect from IBM?" his answer couldn't have been clearer: "You try it and tell me if it works!"

It used to be that consultants had the exclusivity to work in a given area in a company. Today, groups of consultants develop very specialized skills and have *practices* according to their field of competency. They specialize in aerospace, in fluid mechanics, laser research and also in electronic business, and their interventions in specific fields lets them build up their know-how, the total is what makes them so successful.

The change from a territorial, geographical logic to the logic of a skill chain is now standardized fact that is part of today's companies. The professional network of the French advertising company, Eurocom RSCG, enriches its skills as it collects all that is said or done in a particular area of industry while working for international customers. This kind of virtual community interest organization lets them watch the international market better than any regional leader, who would only have a partial vision of his field of activity or the particular market. In a multinational company, the anchor point for each branch remains national, but the *practice's* leader has a global vision. He is the head of all regions, overseeing regional managers in a given branch of industry. For example, the IBM manager for the automobile industry in Germany will coordinate all of IBM's know-how on the global market. He is the boss for the group of local managers in the industry and he is the one to coordinate participation in assignments and the one to coordinate knowledge sharing. This type of organization helps identify and list "noises", weak indications that come from all over that need to be interpreted into intelligible information. It's no wonder that all sorts of companies called early on IBM and other large global companies specialized in computerizing businesses to do their *benchmarking.* That's where they progressively collected an impressive know-how that covers all of the areas of industry in which they work.

In June 1999, IBM Global Services made an agreement with the group Galeries Lafayette. It's a perfect example of the strategic importance of know-how migration and the partnerships that come with it. A new company was jointly founded and IBM Global Services took the majority. The computer department in the group Galeries Lafayette became a company of computer services, MagInfo, who outsourced its services for competitors of the group in order to increase its return of investment. After having put the running of the company on a system of computer management, the new entity, now called MagInfo-Laser Informatique, wants IBM to help it become a key leader in computer services in the business world. Most commentators insist on the importance of the turnover at stake – 7 billion French francs – and the length of the agreement – fifteen years. For us, the most symbolic part of the partnership is IBM Global Services' commitment, as Denis Lévy, general manager of MagInfo, said, "of not having any other agreements with Western European retailers during the fifteen year contract"[91]. In other words, thanks to this partnership, the group Galeries Lafayette skillfully claimed the exclusive rights to IBM's Global Services' expertise in the field, and this for a long time.

91 *Les Echos,* Thursday, July 8, 1999.

4.7. Outsourcing serves to change the corporate fabric

Outsourcing has the quality of changing and improving the economic activity of corporations. Without it, the original economic model wouldn't survive today because it just couldn't adapt to new organizational models, thus probably causing the businesses to close. Outsourcing gives access to new markets. Before, in-house companies usually had only one big customer. Although the option is considered negative for personnel, it gives the new organization a chance to change its logic from that of cutting cost to the logic of creating wealth for many customers, therefore creating new jobs. Tasco, the outcome of an agreement between Shell and the firm Ernst & Young, aims to develop a pool of expert accountants. Tasco took on the accounting department at Shell and now serves as a base for a European group of accounting experts that offer their services to other multinationals. By the year 2001, the group will be involved in many European countries and will have grown from 200 people to 1,200. The reorganization into expert centers is becoming widespread and it generates services with strong added value. They make up new organizations that have their own new economic logic, structured groups of services that become skill centers and increase a company's turnover.

With all of these changes, the companies are also forced to develop their on-line services: networks. Arthur Andersen launched itself into the creation of specific service platforms that brought together outsourcing operations from some of its customers. The firm discretely became the outsourcing champion in the US. In the year 2000, this part of Arthur Andersen brought in 40% of the company's turnover. BP recently set up an administrative and financial service center in the suburbs of Paris. It went from an in-house petroleum supplier to an autonomous profit making unit. *Facilities services,* managed by third parties who have already shown good results on the most demanding markets, are not really new. What is new is the way that Andersen Consulting made the services into a business by organizing a European network of specialized platforms bringing together *facilities services.* It's a fundamental change in the corporate fabric that transformed the services into virtual meta organizations. The change allows for the development of expertise, the specialization of designated units for specific services, the sharing of cost and the work-load through the use of teletransactions between the units. In short, overall productivity is increased with the modification of the economic activity portfolio.[92]

The future for these specialized organizations is considerably different than the one they would have had in a traditional context. It's not enough for them to just pick up the same tasks as their parent company in order to become profitable. They have their own logic for development, taking advantage of all that virtual business can offer. Incorporated into networks, the companies combine themselves on teleservice platforms that are industrialized, specialized and distributed throughout the world. The Italian customer doesn't necessarily know that the work he gave to the Milanese platform will be treated in Santa Domingo in the Caribbean.

92 The European outsourcing market is predicted to reach 195 billion French francs for the year 2001 according to IDC (*Les Echos*, November 19, 1997).

In the end, the big companies contribute to the metamorphosis of the economic fabric when they outsource for operations or assignments. It generates new service activities that benefit from incomparable economies of scale, thanks to virtualization. The phenomenon is made possible by networks whose server/user costs are decreasing. At first this encourages teletransactions between the economic actors and then it allows the race for renewal and change in economic models to begin.

5. The formation of meta organizations changes global geographic economics

In his book, *L'économie mondialisée*[93], Robert Reich tells how General Motors called on Italian stylists, German designers and Japanese value analysts. In order to make the full-length animated picture, *The Lion King*, Jeffrey Katzenberg called on three hundred and fifty artists, animators and technicians from thirty five different countries. This professional microcosmos worked together for four years from various studios. During the whole time, work and ideas traveled through electronic networks. Intangible activities encourage "despecialization" for time and workplace. They also need close collaboration that comes from cooperative work at a distance.

Geo-strategy is established on a totally new data base. The global geo-economy is changing with the need to have access to highly specific resources of intangible capital. The political stakes are changing. A growing part of the world population is becoming a cybercontinent where each one can organize himself according to his personal situation and hopes and where he can join one or more of his favorite virtual communities. They all become members of diverse systems and create strong interactive relationships. Virtuality forces us to become a society of contacts.

Our social and economic organizations are building virtual countries who come about through affinities. Specialized territories accompany skill centers. The making of the future is based on growing specialization in countries and regions worldwide who are closely linked together by telecommunication networks. In the last few years, a multitude of skill areas and geographic centers of concentrated intelligence have sprung up. Today scientists meet more often in Usenet chat rooms than in international seminars. Andrew Piles was able to rework his demonstration of the theorem of Fermat with the input of other mathematicians' ideas. Networks like the Internet have had important cultural consequences that are little known to the general public: it's a multidisciplinary opening. Today, any project can have numerous partners working together from distant places in the world, sometimes from very different fields of interest. New and often surprising associations are formed. It's thanks to the work of Francis Crick in physics and James Watson in genetics and biochemistry that they were able to discover the structure of the DNA molecule. Stochastic equations (laws of probability) that are used to understand how heat spreads, are now used to help understand financial behavior (equation of Black-Scholes).

93 Dunod, Paris, 1993.

The capitalization of knowledge has become absolutely necessary for the progress and productivity of so-called advanced countries. This implies that economic players must invest in training tools and methods that, thanks to networks, are easy to access. For companies, as for countries, the name of the game is by all means to keep access open to the best know-how available worldwide, at the least expensive rates, all while finding new outlets to make it profitable. Global geo-economy and organization structures will greatly feel the impact of these policies that are meant to accumulate or master expertise:

- Growing world competition to attract the best know-how.
- Growth of demands for just-in-time skills and of cooperative work to compensate for the lack of skills.
- Necessity for multinationals to optimize the sharing out of their expertise networks.
- Development of partnership policies to better manage intangible capital.
- Forming of regional business federations.

5.1. The shortage of expertise justifies the increase in collaborative work networks around the world

The search for competitiveness has to be accompanied by the ability to call on the best skills available to develop a new service or product. We use talent in the interest of all concerned parties. Microsoft, Digital IBM and many other international firms call on developers from all countries according to the best adapted expertise for the specific task demanded by the market. In 1997, IBM mobilized five teams from Seattle, Latvia, Byelorussia, India and China to develop Java software. The possibility to benefit from the best intellectual quality at unbeatable prices puts countries, work costs, performances and training methods in competition with each other. For years the Russian training methods supplied brains to western companies. Sun Microsystems, who bought Cray, the super calculator company, hired Boris Babayan, the father of Soviet super calculators, in 1992. In the other direction, Third Wave, the US software company, participated in the setup for a computer company in Lieks, Russia.

Engineers have become workers without boundaries through the use of networks. The cost of training, the diversity of specialties, and the multiplication of needs all make it clear that collaborative work networks are the only answer to the shortage of expertise. It may sound strange in a world where millions of people are looking for work, but the fact is that we’re headed towards a shortage of talent. Although numerous jobs are being created, there is a lack of good professionals in the areas of technology, science and services. America has a shortage of brains and executives so it goes abroad to recruit. The result is that the elite from developing countries, instead of helping their own countries advance economically, are going to work and live in countries like the US, who since WWII have saved more than 6 billion dollars in training costs. Congress recently increased the immigration quota for high-tech professionals. But it’s not sufficient, the quota is reached months before the next term begins. The problem is not just an American one.

More and more countries see their best professionals being head-hunted by rival foreign companies, some of which work *offshore.* The Indian government and its companies are worried that they can't compete with the salaries paid by foreign corporations to their engineers. The shortage of computer skills acts as a brake to economic growth in Asia. Sweden is also worried, as are so many other countries, to see the intellectual hemorrhage flowing from its boundaries. A growing number of Sweden's engineers, a fourth of its degree holding population, is going abroad to work and live. Contrary to what is usually said, the business exodus is small compared to the brains that leave to find better work and living quality. The intellectual relocation benefits the parts of the world who can attract the most intelligent people.

Know-how is really a strategic product. For a price of gold, the American bank Goldman Sachs head-hunted the Englishman, James Golob, considered to be one of the most brilliant financial analysts[94]. Today it's a better tactic to head-hunt for a few very specialized people and pay the price than it is to buy a company.

For a growing number of companies, it's becoming more and more difficult to access work stocks for high-tech knowledge. Knowledge and know-how are rapidly changing and when you couple this with the speculative nature of the contribution of skills, it opens the path to versatile ways of hiring, very different from the traditional ways. This leads to a greater importance of the possibilities for use of computer-stocked intangible capital, and to the access to experience and know-how exchange networks, on demand when needed. Peter Drucker, who anticipated that intangible capital would be a key factor to the competitiveness between companies and nations, noticed that the present change would only succeed in companies that knew how to share and exchange their know-how in efficient and economical ways. The idea was confirmed by the INSEE in July 1999 when they published the results of a survey about the relationship between the use of the Internet and the development of small companies with less than 20 employees. The small companies who were connected to the Internet developed twice as fast, doubled their added value and hired two times more than the companies who didn't use the Net[95].

The smaller the company, the more important it is to use electronic networks to exchange knowledge. In France, 60% of all service businesses are individual and lead in added value. 73% have less than five employees and 42% have no employees at all[96]. Individual knowledge and expertise becomes the base for wealth in a society of knowledge. That's why society is also becoming a virtual professional community. Meta organizations of varying sizes can group together and share their individual know-how to accomplish all kinds of projects and assignments.

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94 According to the September 3, 1999 issue of *Le Nouvel Economiste*, James Golob and his team left the Deutsche Bank for the amount of 20 million dollars.

95 The respective average growth of those using Internet compared to those who do not use Internet: +7.2% against 3.6%. Cleared added value: 7.3% against 4.2%. Hiring: 4.6% against 2.7%. Even though the survey only gives an indication of how modern a company's directors are, there is a tie between the use of communication technology and a company's good results.

96 According to the service survey carried out by the INSEE in 1996.

5.2. Corporations restructure their alliances to better manage their intangible capital

Since 1980, we note that networks bring companies together. They come together more and more frequently in order to have access to new skills, reducing the need to make big investments in intellectual capital for the totality of their activities portfolio. These alliances are just as determining as traditional capital restructuring for the creation of wealth. In other words companies go from a capital management logic to an intangible capital management logic.

Ford completely restructured its world organization into five skill centers or Vehicle Program Centers (VPC), throughout Europe and the US. The units bring together Ford's global know-how for a specific line of products: minivans, small cylinders, trucks, business vehicles. Ford's move towards concentration in specific activity poles generates added value, highly innervated in electronic networks. It is now becoming generalized to other companies. When The European Agency for the Evaluation of Medicinal Products moved to London, it lead to the London setup of Bayer's services for medicine approval. Other companies like the French group Rhône-Poulenc Rorer and the Swedish Astra and Pharmacia followed. The development of research done with partners varies with each firm, from 5% for Rhône-Poulenc Rorer to 30% for Smith Kline Beecham along with selective agreements from time to time. Skill sharing becomes essential in many areas of activity that are under pressure from the globalization of business. In pharmaceuticals, multiple partnership networks are necessary to face research expenses. Pfizer installed the network Pfizergen that unites twelve biotechnological companies specialized in research for the genome. Rorer developed a network of eighteen genetic therapy companies[97]. Business networks also put small companies together who share goals, assignments and projects. *Bird link to the world* brings together anyone that has to do with bird migrations in the world on the Internet. This virtual organization doesn't have a strong structure or a central pilot. Each part of the system has its own life, sharing what they believe to be important for the other members of the network and mobilizing the whole and if necessary, sharing professional help.

Management of intangible capital is the biggest motivation for pulling companies together in France. The operations were multiplied by thirty between 1979 and 1985. If at first the accent was put on the need to reduce running costs, especially with economies of scale, it's now put on the economic access to knowledge chains with high added value. Rival companies are making agreements for partnerships in the area of research at lightning speed. It's come to the point where MERIT (Maastricht Economic Research Institution for Innovation and Technology) counted more than 3,000 cooperative agreements, that is twice the amount for the entire last decade. Jean-Jacques Salomon[98] speaks of technoglobalism to illustrate the phenomenon. He notes that most of these alliances develop independently from public structures and represent, in Europe, an investment much larger than the means with which the Commission for European Communities works in the areas of scientific and technical cooperation. Jean-Jacques Salomon concludes that traditional boundaries are disappearing

97 *Les Echos*, November 28, 1998.

98 Professor at the National Conservatory for Industrial Arts, from the September 23, 1993 issue of *L'Expansion.*

between companies as they form new oligopolies, becoming new sources of innovation. Through the formation of company clusters associated with training centers, and with scientific and technical subjects considered as being secondary, these meta organizations now have a turn at being generators for intangible capital, for brain power. In this way, they play an important role in the long-term local development.

5.3. Regions federalize corporations in order to assemble intangible capital

Every region in the world wants to be dominant in one or more areas of activity in order to preserve their capacity to create wealth. In order for them to do this, they encourage the local development of skill centers by bringing companies together, and often they are helped by fiscal advantages. Expertise is federated with other distant skills with which it's possible to create real cooperative networks firmly rooted in specialized regional poles. The problem with this development policy is to keep talent in one place so that it is not dispersed and to federate skill poles that are attractive enough to bring in new members with fresh know-how. The regions use electronic networks to create virtual professional communities and to attempt to focus expertise for their benefit by increasing the number or alliances that indirectly attract more partnerships. We initiated this reasoning in 1998 with the program for the development of the European network in the European Center for Risk Prevention (ECRP) at the instigation of the most important French mutual insurance companies in the Niort region in Poitou Charente.

This strategy is also used by big companies who are looking for growing returns in their networks. They leave little room for competition by multiplying alliances in order to build virtual communities, meta organizations, that represent a market, a group of specialized know-how. One effects the other, the most dynamic regions, companies who are gifted in making alliance agreements, concentrate important intangible capital that makes an attractive skills pole, economically profitable.

Research laboratories in Israel employ thousands of well-trained, highly specialized immigrants. With 62 companies on the stock market in the US, Israel is the second foreign country, behind Canada, on the American financial market. Three fourths have high-tech operations. Like many countries that lack natural resources, Israel invests in human capital. It has the most engineers and researchers in the world. The growth of its high-tech sector is mainly in the area of numeric imaging, the elaboration of electronic circuits, contact lenses and also visiophony applications, telephony and simultaneous dialog, as the example of ICQ (*I seek you*) from Mirabilis on the Internet, that operators throughout the world fight for. According to Stéphane Garelli's report, a professor from the University of Lausanne, every global region tries to have a skills pole that is its differentiating strength. Research in the north of the US, marketing in the southwest, medicine in New England, *design* in Italy, logistics with the platforms in Singapore and the Netherlands. These specialties evolve as telecommunications grow in importance.

It's the same with Silicon Valley, a pole that generated added value dedicated to the NICTs. It's still the region that exports the most in the US with 29.3 billion dollars, ahead of New York, 28 billion, leader in financial services, and ahead of Detroit, with 27.5 billion dollars in

the automotive industry[99]. Other regions endeavor to create specialized industry networks in areas where development is strong. The New York region is now building a pole that generates industries specialized in Internet content using its rich experience in the edition and publication industry. The New York Information Technology Center, or *Silicon Alley* as it's called, is considered the center of the movement that unites the most talented graphic artists, journalists, advertising executives, all desiring to make electronic networks the spearhead for lucrative business. The movement is so dynamic that New York City has the greatest amount of web sites in the US[100]. The recent development in the area is evident: 5,000 companies with nearly 105,000 employees, with a turnover of about 6 billion dollars. According to a study done by the New York Media Association, 68% of Silicon Alley companies are less than three years old and 83% still have a turnover of less than 1 million dollars.

Sometimes spurred on by public authorities or sometimes by one or several leading companies, we see an increasing number of poles that generate skills with high added value and that work in close cooperation to locally become sources of wealth. In Europe, Berlin-Adlershof, formerly an historical suburb of ex-East Germany, is trying to become a research pole that generates wealth. A considerable amount of intangible capital is represented by more than 15 research institutes and 200 high-tech businesses. The Berlin Senate, Berlin-Adlershof's promoter, says that it should become one of the largest technopoles in Europe. As for Belgium, it wants to create the Silicon Valley for language[101]. In the year 2001, the market for automatic translation tools should be worth about 20 billion Francs. In 1997, the first European company for computer-assisted translation, Lernout & Hauspie whose headquarters are in Belgium, declared a net gain that was equal to 20% of its turnover. In 1995, the company was worth 18 billion Francs on the NASDAQ. The company with its 1,500 employees, wanted to federate the best skills possible, and created a support fund in order to attract investors and businesses interested in the market.

The 21st century is becoming a society of knowledge where added value flows through all kinds of networks. Large and small companies adapt their organizational and business models to make better use of intangible capital. They federate in business clusters, specialized networks of knowledge and business communities. Regions are becoming partners with companies, increasing the number and variety of initiatives to form meta organizations capable of dominating, for their benefit, whole parts of economic activity. The race is on. In fact, it's only just begun.

99 OTEC (Observatoire européen des technologies de communication) October 8, 1997.

10041,156 New York City sites for 1.1 million registered US sites. Gilles Sengès, "New York cultive sa Silicon Alley", *Les Echos*, December 18, 1997.

101*Les Echos*, May 20, 1998, a survey on European software industries.

III. THE DEVELOPMENT OF META CORPORATIONS

"Human machines are linked invisibly.
The spring that moves one raises the others."

Montesquieu

Every time EDS, a value added network (VAN) provider, launches a Europe-wide advertising campaign, it illustrates the concept of co-sourcing by involving in it one if its clients and highlighting the strategic advantage the latter gets out of it. Saab, the Swedish car manufacturer, was successful in reducing by half the time needed to assemble a vehicle. Cable & Wireless claims to refuse millions of dollars worth of orders. What they don't say is that these orders are allocated to partners with whom the company shares a multitude of the skills needed to run the client's work site. "We are neither a multinational nor a corporation (much less a conglomerate)," states Cable & Wireless. "We are a federation." A federation of companies that enhances the expertise of Cable & Wireless, thanks to its local contacts, and that, in return, collaborates with advanced telecommunications experts from around the globe.

As we have already seen, these meta organizations can form meta networks or meta corporations. For example, airline companies develop alliance agreements to better cover the most profitable destinations. Concretely, they pool or exchange tangible resources: terminal and maintenance areas, sources of revenue, ferry charges, information technology and telecommunications media, and reservation codes. The One World network is nothing more than the affiliated network of American Airlines, British Airways, Canadian Airlines, Cathay Pacific, Finnair, Iberia and Quantas. Then there is Star Alliance, a network of European affiliates that one by one has attracted Lufthansa, SAS, Austrian Airlines, British Midland (6,000 employees), and Singapore Airlines. These two networks form a meta network, the key element of which is the creation of complementary products around one central computer system that usually becomes the backbone of the whole thing. The Air France-Delta Airlines duo is a similar type of setup but follows a different strategy: the network is built up through short-term alliances with companies like Aero Mexico, Transbrasil, Korean Airlines, Air Jamaica and Air India. This is actually more a meta corporation because there is no integration into one central computer system. In the first case, cooperation may be weak but integration strong; in the second case, integration is weak while cooperation is strong.

These types of meta corporations aren't really that new; it's their recent boom that's impressive. By reducing operations and market access costs, and making it easier for even the smallest of companies to launch new businesses, telecommunications facilitate exchanges and collaboration among the various partners. The virtual corporations formed by these numerous alliances thus limit the staggering increases in expenses, making it possible to win new clients and keep them. This strategy of combined added value and all-inclusive products is quickly becoming a must for any company that wants to:

- spread its activities to other sectors at a lower cost;
- maintain its expertise at the highest level possible;

- keep its goods and services in demand.

Following the structural changes initiated in the early Eighties, companies are becoming accustomed to outsourcing certain functions that can be carried out more efficiently outside their walls than within. This subsidiarity policy engenders new, highly specialized companies, thus limiting investments – most often poured into upgrading computer systems. Over the next decade, these alliances between internal and external media will help companies reduce their costs and diversify their products and services thanks to an increasing number of co-marketing agreements.

Information technology networks facilitate the creation of a number of diverse virtual organizations, which reorganize into new structures. These are clusters of companies and they embody the corporation of the future. Today these meta corporations explore the new types of relationships that will be established among them and with their markets. This movement is destined to expand with the growth of co-distribution, co-marketing and the creation of short-term organizations. Competition is now based on inventing new ways of creating wealth by forming alliances. The challenge is finding *the* killer virtual business model.

1. Corporations of the future: organizational chains

The company of the future will be a co-corporation or, even better, a federation of companies: a composite entity grouped into one meta organization. These are no longer small, medium or large companies; they are more or less vast networks of differently sized companies that pool their resources to do business and create value together. Forget the legendary idea of the solitary and ingenious entrepreneur, or of the universal company with a globalizing business model. A multinational is never anything more than a sum of domestic structures. The optimization of the value chain through subsidiarity has changed the rules: you take the best link in the domestic chain and close all the rest. If you're not a multinational, you build a chain of partnerships according to similar rules; alliances should be sought in those countries capable of supplying goods or services at the best cost/performance ratio. That's why the purchasing function has become so strategic.

Regionalizing the economic chain through task sharing within a same value chain is the equivalent of the virtual corporation: groups of sub or co-contractors are mobilized as the need arises. However, in a context of globalization, the regional presence of a partner often facilitates business and relations with the locals. This rule remains intangible whatever the type of structuring. The companies of the future keep their strong foothold locally yet strengthen their capacity to combine forces by forming clusters of complementary activities to create a meta corporation that can do business globally. Like any other company, these clusters will be more or less integrated into virtual professional communities. They will be able to form business networks aimed at specific markets, or work on common research & development themes.

Companies will be less isolated compartments than members of a meta organization created to respond to one or several specific needs. Small and medium businesses will gradually become the model but also the benchmark link for the economy and "unlikely" organizations[102]. Small companies will become more robust and reduce their overhead. The larger companies will lighten up their structures to adapt to the necessary rapidity of the movement. Having developed a covalent bond with their partners, thanks to electronic networks, companies will continually recombine by conducting a policy of cooperation, at times quite complex. The executive of the 21st century will have to continually speculate on the future competitive advantages he or she could gain by forming alliances with other organizations, in an attempt to become more powerful on the market.

The number of pluridisciplinary partnerships around the world is increasing because they change the economic base of each company for the better. As borders fade, telecommunications facilitate and favor these consolidations. Thanks to the leverage effect created by organizing into meta corporations, managers have at their disposal an unprecedented capacity to invent original socio-organizational models, sometimes very different from existing business models. Aided by the virtualization of organizations, imaginative combinations make it possible to develop new patterns in the value chain, thus optimizing the most diverse economic models.

In the future, companies will have to adapt to drastic changes in operating plans to create wealth. They will be simple, robust, flexible and agile in order to have the capacity to combine with other companies. To do this, by relying on information technology networks, companies invent new structures, new forms of organization designed for specialized functions yet capable of high productivity on behalf of their respective interfaces.

1.1. The majority of meta corporations are small to medium businesses

The demassification of companies results in the multiplication of "light organizations" (also known as "gazelles" in California). Twenty-five years ago, in the United States, one person in five was employed by a Fortune 500 company. Today that figure has dropped to only one person in ten[103].. In reality, virtual companies, or meta corporations, are essentially small to medium businesses and microcompanies[104]. In France, according to an INSEE study conducted in 1997, the creation of groups of companies has increased spectacularly over the last fifteen years. Small organizations of fewer than 500 employees have progressed the most. Their number increased from only 630 clusters in 1980 to an amazing 6,700 in 1995, for a total of 20,000 companies, accounting for 37% of total employment by French small to medium businesses[105].

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102 Microcompanies will represent 40% of American companies in the year 2000. The will generate annual sales of 2,300 billion dollars compared to only 72.8 billion in 1994. Every day, 1,400 people in the United States launch microcompanies.

103 Translated from the article by Thomas Malone (MIT) and Robert Laubacher, associate researcher for the project "Inventing the Organizations of the 21st Century", which appeared in Harvard Business Review, Futuribles (June 1999). In France, the threshold effects imposed on companies with more than eleven employees could further accelerate the trend (author's note).

104 97 % of French companies employ fewer than ten people.

105 Insee Première, n° 553 (November 1997).

These clusters are generally organized around one national or international leader that runs and coordinates the entire operation. In this sense, the Americans were the first foreign-owned federations of clusters to settle in France, while French clusters abroad doubled between 1989 and 1995. Senior management had understood that over-expansion was leading companies to refocus on smaller production units, which were matched up to the best of their overall efficiency: Hamish McRae, a journalist at The Independent in London, spoke of "velcro" enterprises.

Instead of just a few large corporations, it will be these meta organizations of companies that dominate the economy. These small-medium businesses pool their resources, increasing their respective potential tenfold. Galéphar is a French virtual company divided into three partner entities that share responsibilities. One company handles the marketing and management functions, while a second company takes care of the pharmaceutical R&D. Most of the administrative tasks are subcontracted, while the third entity manages logistical problems. This is an organization that favors the networking of different production units linked by a same sector of activity, in a geographical space likely to globalize. This is the case of Sodip, a French network of accounting experts created in 1989. The network began with only 16 firms and ten years later includes 258 offices in 50 countries. It changed its name to Inpact upon forming an alliance with the American network, CMPS in 1995. With 4,700 associates, and worth 1.6 billion francs, the growth of this network, whose purpose is to help small to medium businesses globalize, remains strong. Its president has also been adding fuel to the flame to continue its geographic development and widen its range of services. To do this, he increases the number of alliances with companies involved in other professions, relying on the Internet to follow through with the whole.

There will be a multitude of diverse work arrangements in the future, with the organization of work on networks, the increase in retired workers accepting assignments with several different companies, and hybrids between salaried employees and self-employed workers[106].. But we can't emphasize enough the concept of "small is beautiful." The self-employed may think of themselves as independent, but they usually aren't as much as they'd like to think because they're generally integrated into a multitude of diverse networks, hence inevitably interdependent. They do, however, benefit from the strength of networks, when they know how to create one or become part of one. In this way they don't put all their eggs in one basket by depending on one major principal. In reality, small-medium businesses or microcompanies are not only organizations that are isolated from one another, but they can also be a part of meta organizations within more or less structured networks. The development of networks of franchises and clusters of corporations, as in the case of Benetton or Zénier in the European textile industry, illustrates how limited the concept of independence really is, but it also reinforces the "united we stand" concept. However they are structured, these clusters of companies increase their potential in all domains, including job creation. Once again according to INSEE, between 1984 and 1992, isolated small to medium businesses lost 270,000 jobs whereas clusters of companies created 300,000 of them.

Meta corporations are professional clusters that combine their resources or skills to gain competitiveness. They build an affiliated business community that remodels their relations with customers in order to satisfy and retain them as best as possible. Meta corporations, like

106Migrations that partially distort the perception of the respective development of the wage earning class and self-employment.

business communities in general, are formed with the intention of gaining power and commercial synergy. A good example is Floritel, a company that, after having used the French videotext system to do business, shifted over to the Internet to deliver flowers worldwide by mobilizing a traditional network of florists. Floritel, which exports 50% of its annual sales, passes on the orders received on its home page to its network of affiliates. In this way it created a community of florists that benefits from this extra service: florists can now offer this global network service to the customers who walk through their doors. Moreover, thanks to its network, Floritel was able to renew traditional services by proposing ready-made bouquets presented on its site with color photos: the shipper sees what the customer is going to receive. This business community expands on our idea of the virtual company. Here is a network forming a business community, which could one day consolidate its identity and use the new characteristics of the cybereconomy to its advantage to widen its range of products.

1.2. "Instrument" organizations: the made-to-order virtual corporation

Thanks to virtualization, meta corporations will be able to form on demand and made-to-order. The organization of the Olympic Games, or the World Cup soccer tournament, is a short-term organization. From 200 employees upon its creation in January 1997, the World Cup in France employed up to 28,000 people in June 1998, before winding up 542 days later. With virtualization, "disposable" companies will become the most common instruments. For two years the French boat competing in the 1999 America's Cup, Bouygues Télécom-Transiciel, mobilized eight architects and engineers, plus a group of skippers who tested 80 models out of the 300 submitted before deciding on the boat that took on the challenge of the New Zealand Cup. The pooling of this collective intelligence, resulting from the experience of teams that had already competed all over the world, was the first exploit of this future competition. It mobilized for a limited amount of time a formidable array of equipment, but also the knowledge of experts in materials technology, hull design and prototype building, as well as seasoned skippers.

All over, notably in the entertainment business, specialists form short-term organizations on demand. The Frenchman Bertrand Lazare filled this niche. After having worked all over the world for Matra, he jumped into creating online activities related to artistic or sports events. One evening, while watching the "ToBeThree" concert broadcast on television from the Zenith theater in Paris, he had the idea of creating a web site for the group, to complement their artistic performance with products and services. His new career was launched from there. There is incredible demand for artists, who are often light years from the net culture and its business potential. Bertrand Lazare launched Opéraction, a company that continues to unite artistic and sports events all around the world by creating, upon demand, a specific virtual company through his web site. This approach is similar to that of the start-up created by Marc Geiger, co-founder of the Rolling Stones web site[107], of which the famous rock stars are shareholders.

You must be objective when creating wealth through "instrument" virtual companies. More than three quarters of the 800,000 American companies created in 1987 with at least one employee had failed between 1988 and 1989. According to the Small Business

107This group was worth 220 million dollars in 1996. For more information, visit idealab.com. eToys and GoTo.com are listed on the Nasdaq.

Administration, 80% of companies created in the United States fail during the first year of activity[108].. With the neteconomy, the desecration of companies is accompanied by the acceleration of the Schumpeterian process of creating and destroying organizations, some of which collaborate on a short-term basis. Why? Because with the network economy we're going to witness the creation of increasingly volatile markets; a drastic change owed to the intangible market, which substitutes possession with use. Impulse buys will increase in our modern zapping culture. Suddenly, the neteconomy is an economy based on the amount of time we spend on it, like the time we dedicate to a hobby or any kind of task. As its uses multiply and diversify, buyers in entire sectors will contribute to developing short-term markets, or they'll decide alone the prices they're willing to pay.

What's surprising about that? The general acceleration of time had to have an influence on the process of destroying-creating new organizations. When you consider the process of creating value through the inventiveness of an original economic model, why wouldn't the destruction of value be just as rapid? The start-up launched this morning might be the one that kills yours tomorrow. One year, one month, one day, even one hour, that's how long a brilliant business model can last. Executives drive organizations that go faster and faster, and they must sharpen their reflexes accordingly. In a network economy speed affects everything, and the capacity to conduct opportunist strategies and combine just as quickly with other companies is a key factor for success.

1.3. The winning combination: meta corporations cash in on their leverage effect

The leverage effect consists of finding out what kinds of mutual advantages two or more companies can get out of lending a part of their resources to the other in order to form an entity that will gain a new competitive edge. Take a look at Freeserve, today the leading provider of freemail in the UK. Two years ago this company, which had no telecommunications network, signed an agreement with Energis. Then, since its name wasn't recognizable either, it formed an alliance with Dixon, a leader in household appliances. These strategic alliances allowed it to spectacularly increase its value on the stock market.

Each company draws from the experience and assets of the other to achieve added value or overall productivity. Federal Express (FedEx), an express transportation company, replaced Commodore Business Machine to ensure its after-sales services. Now when a client calls, he or she is placed directly online with FedEx, who will pick up the machine, provide a temporary replacement machine, and later bring the repaired machine from the manufacturer's maintenance center in Memphis back to the client. Many transportation companies are starting to provide an all-inclusive logistics service for manufacturers and distributors. Rank Xerox also regularly uses this formula to have its machines picked up, delivered and installed at its clients' offices. The clients don't even know they're not dealing with a Rank Xerox employee. A manufacturer of electronic components, National Semiconductor (NAS), handed over its transportation department to FedEx, leaving its warehouses at the disposal of its vendor. All of NAS's production is handled by FedEx, who stores it in the company's warehouses in Singapore. This new organization made it possible to reduce storage and distribution costs from 2.9% to 1.5% of annual sales.

108www.artistdirect.com

In the fall of 1997, American On Line formed an alliance with 3Suisses, a mail-order company. AOL contributed its know-how in online services, as well as its nine million subscribers. The latter were solicited electronically and received a CD-Rom containing the 3Suisses catalog. This CD-Rom provided a link to the virtual boutique set up on AOL. There's something for everybody in these co-branding formulas, which are cropping up like mushrooms via more or less complex partnerships. We thought companies were simple; they were only rudimentary. The new organizations rapidly multiply out of sophisticated combinations. We are shifting from a 19th and 20th century business model to an imaginative and innovative upsurge of all kinds of organizations that merge for more or less long terms and rely on one another to develop.

The cybereconomy will boost this faculty. The practices that make a company an instrument for creating wealth for everyone are becoming commonplace. Bill Gross is part of this generation of entrepreneurs launching "instrument" companies. This extraordinary Californian has been enjoying an extra slice of fame pie since the introduction on Wall Street of Shopping.com. Since his first company Idealab! in 1996, he has launched some thirty companies[109]. Idealab! has become the incubator of his other companies, all set up on the Internet. It would take too long to list all these little companies – the largest employs some one hundred people – that together form a cluster. There's the online auto dealer, the advice and services for domestic animals, toy stores, cooking recipes, city and state guides, intranet installation, job search sites, voice mail services for telemarketing, online shopping and more. A visit to Idealab's sites will show you just how diverse Bill Gross' activities really are. Behind these apparent dissimilarities lie two of the major characteristics of how clusters of enterprises are structured on the world wide web.

First, a keen sense of opportunity. When a need arises, you give it a try; except in certain sectors, this won't cost you much. Then a business organization is set up, which functions according to a "contaminant" schema, characteristic of the net strategy, in order to achieve more leverage effect. The clients of one company can serve as a stepping-stone to build up the clientele of another. All of Bill Gross' creations are structured around a low-cost sales and distribution strategy, aimed essentially at groups of population accessible through the same sales network, the Internet.

In this new symbiosis, the size of a company doesn't really matter much. The small companies act as pilot fish for the larger companies, or the larger companies help the smaller ones to export. These developments join large and small companies, which mutually support one another in order to gain market shares. These small businesses, forced to win the favors of existing companies through negotiation, are organized into networks according to professional and personal affinities, either out of a desire to expand or out of sheer need because pressured by the markets or their shareholders.

109Denis Ettighoffer, e.Business Generation, Village Mondial, (Paris, 1999).

1.4. Meta corporations use networks to form trade communities

International trade has tripled over the last fifteen years with the multiplication of service exchanges, which renders the markets even more sensitive to the costs of labor and corporate taxation. The principle of subsidiarity is in full swing. The percentage of trade exchanges in relation to annual sales rose from 60% in 1990 to 70% in 1995, a rather high average that conceals some significant disparities: purchases at the French car manufacturer PSA amounted to 72.4% of annual sales while at Essilor they were 46.6%.

"When an American buys a Pontiac LeMans from General Motors," says Robert Reich, "he unwittingly takes part in an international transaction. Of the 20,000 dollars paid to GM, about 6,000 end up in South Korea for the routine work and assembly, 3,500 go to Japan for the major components (motors, transmission and electronics), 1,500 to Germany for the body design and design engineering, 800 to Taiwan, Singapore and Japan for the small components, and 500 to Great Britain for the data processing. The rest, less than 800 dollars, goes to the strategy developers in Detroit, to lawyers in New York, lobbyists in DC, insurance agents and members of the health profession all over the United States and, finally, to the GM shareholders, the majority of whom live in the US, but of whom a growing number are foreigners[110]".

While capital is globalizing so is work, which now moves around the globe according to the evolution of the value chain. The reasons for this are the same for everyone, Americans, Japanese or French: the need to optimize returns in the face of local structural or conjunctural constraints. Companies break down their big functional units and optimize costs by better allocating their resources around the world. In virtual companies, one or several functions are taken over by another company that has regular (a design office) or occasional (an interim marketing team put together by a specialized Manpower) contractual relationships with the first. Incidentally, the term co-contractor is preferred to sub-contractor.

In the same way, PSA decided to totally reconsider its industrial integration policy. Peugeot PSA gave up a part of its internal component production to favor outsourcing. This way it practices subsidiarity between internal and external by reducing its activities and therefore its investments. This approach will further accentuate its need to cooperate with its partners, some of whom it has collaborated for a long time, as it was Peugeot that created them. By relying on collaborative networks, these companies strengthen their capacities to invent. Peugeot cycles uses the Logility Value Chain Strategy modules of integrated supply. The modules cover the entire logistics chain, from client administration to production, to the management of inventory and the spare parts needed for production and restocking.

In order to achieve better overall productivity, these companies continually optimize their added value chain by constantly modifying the access to the resources they need to operate. By delegating some of the functions that they don't perform as well as others, their size diminishes (along with their fixed assets); they become more agile, and the interfaces become more sophisticated, more interactive. Each specialized production unit has strong links with its corporate body to preserve its strong expertise. Designing products or services leads several of them to cooperate regularly, which reinforces their interdependence. So now, after the purchasing function, it's partnerships that become strategic.

110Robert Reich, L'Économie mondialisée, Dunod, (Paris, 1996).

1.5. Corporations will create partnership departments

James R. Hougthon, president of Corning Inc. (USA), believes his alliances with 19 partners have enabled his company to more rapidly create and sell new products. In 1996, Daniel F. Akerson, president of MCI, declared that his company's alliances with over one hundred partners had enabled him to offer quality products and services designed by a group of talented people, and that this would have cost him over 500 million dollars more per year if MCI had done it alone.

After delegating functions, companies multiply alliances to favor, among other things, their access to knowledge. This leads them to share the cost, sometimes with schools and specialized university centers, of the research needed to develop new products and services. This process of cross-fertilization, which mobilizes the knowledge of several companies to launch a new product or service, is known as combined added value. These companies then join forces to mutually co-distribute their partners' products within their respective zones of influence. The term "all-inclusive service" is used to illustrate the development of partnerships among companies providing complementary goods or services: for example, the airline company that offers hotel reservations and car rentals. Each partner proposes the services of the other partners. Companies think all-inclusive service by multiplying partnerships (co-branding) within complementary sectors. Co-branding favors the creation of meta corporations, which organize into powerful business groups.

John Scherer is an American who travels all over Europe. His job is to contact possible European partners for his company, an American arms and missiles manufacturer. He tries to build industrial and commercial alliances. For his employees and him cooperation is the best way to limit European competition[111]. A new fad is all the rage in the boardrooms, which recalls the words of an old French song: "Whom are we going to marry, to marry?" A sign of the times, marriages are most often reduced to acquisitions and short-term contracts. Far from the media frenzy, thousands of alliances are created in a multitude of economic sectors[112].. The context of globalizing trade and business increases the need for co-development or co-distribution among companies that can combine their activities in a given geographical area.

All companies, including the largest ones, know they need alliances to go global. Celtipharm, a small French veterinary products manufacturer, joined forces with eight other companies to present a catalogue of complementary goods and services on its web site. Companies build up partnerships around the functions they perform best (not always their original area of expertise). The partners handle the areas in which these companies feel most vulnerable. An insurance company that has built up an efficient network of agents but lacks innovative products, may form an alliance with a company that excels in this area. Thus an increasing number of companies sell products made by others. The online bank Cortal didn't even attempt to sell its own mutual funds. Astutely, and so as not have the competition down its back, it sells equities already proposed by traditional banks. In this way, Cortal becomes an

111See Le Point dated August 27, 1999.

112The October 20th 1999 edition of the French weekly, L'Expansion, announced that Booz Allen's firm had counted over ten thousand alliances around the world per year. This figure should be a lot higher if you count the cooperation agreements between small businesses and various unknown companies.

intermediary dealer of financial products, a specialized teller window that increases the value of products fabricated by others, with clients it knows well and follows individually. Cortal's business model was oriented towards its customers and the market rather than being simply product-oriented. Its strength lies in its distribution network and its strategy of building the largest customer base possible.

This strategy of redefining organizations around a certain expertise or strong strategic position, allows companies to save significant financial resources, which is bound to incite the development of all kinds of virtual companies.

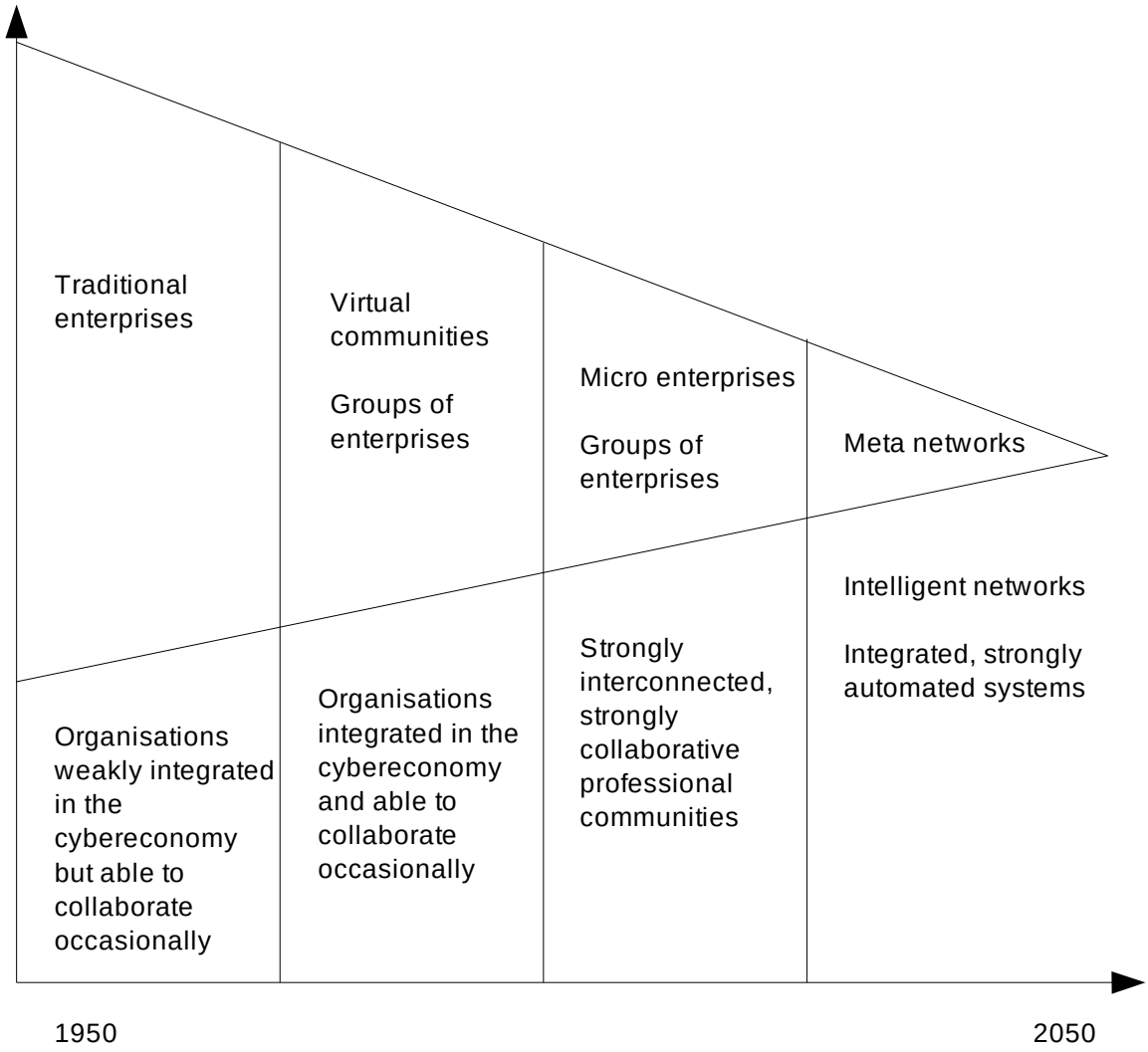
2. From virtual corporations to virtual corporate communities

Considered virtual because of their capacity to master the three gifts (ubiquity, omnipresence, omniscience) offered by the Internet, mentioned in the first chapter of this book, companies now optimize their operations by sharing out their resources differently. This progressive redeployment almost always leads a company to reconsider its ties with its vendors, customers, partners and distribution network[113]. In short, all company managers quickly understand that, especially if they're not running a global company (which is the case for the majority), they must strengthen their ties with other organizations to really profit from the advantages of virtuality. They must agree – which isn't always easy – to become a co-corporation by joining one or several more or less organized professional bodies.

These virtual meta organizations are relatively informal. They conduct the classic business transactions. The combinations of deals made among these companies most often originate within professional communities, which in this way combine their competitive intelligence, technical know-how and certain business expenses. Market-oriented, virtual companies are not only the fruit of a few executives' will, but more often a combination of circumstances. They will combine the talents and resources of several partners to solve a problem, manage a work site, or respond to a need on the market by adding to their ranges of products or services. Based on resource-sharing, meta organizations join forces with several companies that get organized and combine to reach a common objective and share the eventual profits.

They can also be the result of alliances among professional communities that mobilize several hundred personal computers to unscramble an encryption or start a project, just like Linux, or even to work on the answer to a specific problem. A virtual organization like this has the advantage of being relatively flexible. It can be created by entities of a multinational that, as is the case of Reuters, adds entities from other companies to their own organization for a very specific purpose: to respond to an international call for tenders, develop a financial engineering plan or launch a large-scale promotional event. Only a part of these functions can virtualize (contrary to meta network companies, as we'll discuss later), generally under the pressure of the market, to economically access the material or intellectual resources available in a virtual community.

113See the effect of the announcement of the sale of Apple Computers.



Breakdown of virtual organizations by type of structure
From left to right, the largest to the smallest.

3-1 Foreseeable evolution of business organizations

The major characteristic of virtual companies is their unique "plasticity". This type of virtual company is a well-adapted organization when involved in complementary professions or skills than can function independently. The relationship is established around a "contract" that constitutes the commercial tie between the companies. Don't respect it and you'll become the black sheep within the corporate communities that use the networks a great deal to stay informed.

Microcompanies, freelancers and SOHOs (Small Office Home Office) can all be found within these informal organizations – which coexist very well with traditional organizations. This organization into virtual professional communities[114] facilitates the multiplication of relations between companies of all sizes and freelancers or contract workers (which can represent up to 30% of workers in Silicon Valley). The whole system works by relying on networks and standards supported by most software packages and consumer network providers.

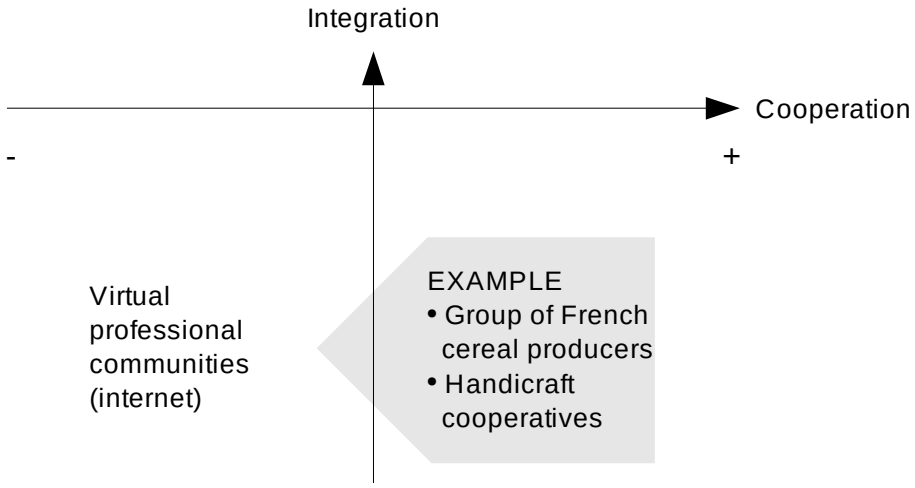
2.1. The structuring systems of virtual organizations

Even when virtual, the corporate structures set up on electronic networks are very different from one another. Right away they face a dilemma: choosing between a too "soft organization" and a too "hard organization", between the possible volatility of an informal virtual organization and the possible rigidity of a restricting interdependence, both due to the intense integration into a network.

On top of the list of possible structuring systems there are virtual professional communities, which do business "deal by deal" (events and promotion) by combining their respective know-how. Then comes the system of more formally grouping together meta companies, clusters of companies that are continually renewed thanks to new networking tools, which is the traditional idea of economic interest groups. Finally, companies can lose their sovereignty in different ways by merging into a meta network of companies structured on the same information technology system. This last highly integrated and interdependent way of structuring a virtual organization improves the responsiveness of the systems network, enabling incomparable productivity gains. But let's go back to the first two models that interest us in this chapter.

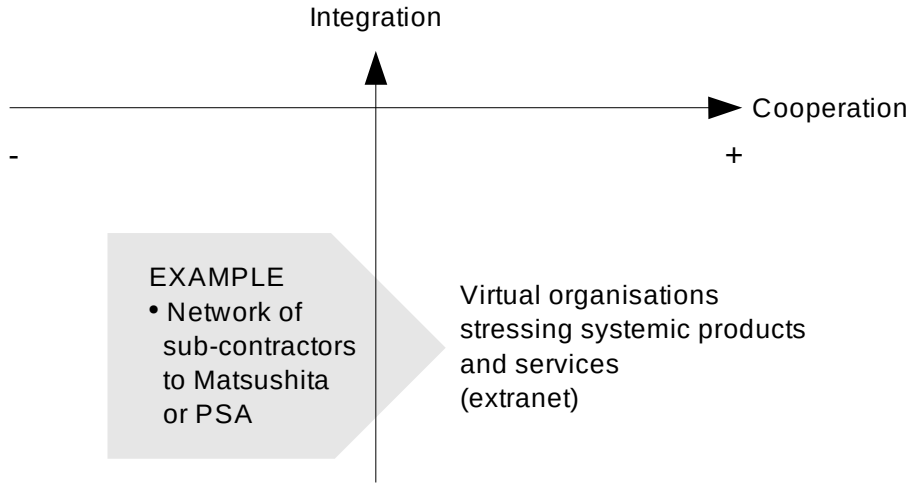
In general, virtual organizations are efficient if you have to work on relatively nonintegrated systems products and services: for example, a group of artists in a cooperative relying on a common service platform. These kinds of swap arrangements are generally appreciated by companies that develop their business transactions with a growing number of partners by forming clusters of companies dedicated to one market or very specific product lines. Each link, depending on its particular niche, contributes to the entire value chain for a more or less limited period of time. The whole chain consists of a group of companies federated into interest communities, and sometimes using common resources within a "virtual industrial zone". These alliances may have formed out of a chance encounter at a convention or in a virtual marketplace on the web. In any case, this type of virtual business community remains fragile. Value chains formed like this sadly lack in coordination and controls when they're not very integrated and they don't rely on a single IT system (see figure 3-2).

114In august 1998, Microsoft launched the Home Advisor site, a consumer service competing with the national association of real estate agents grouped together on the Internet. The site provides practical advice and comparative listings on home financing companies.



3-2 Weak cooperation, weak integration

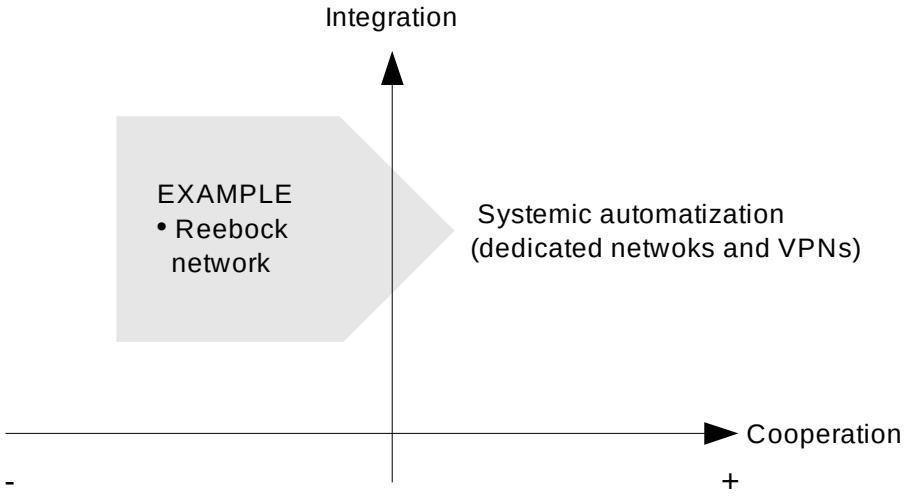
But it's not always enough to get organized by increasing the combinations of circumstances; virtual companies must sometimes agree to federate more formally. Over the years and with more experience, alliances can become even stronger if the parties involved are able to show a sense of responsibility and the capacity to adapt to the operations of the whole. Of course, the concept of virtual company implies an atmosphere of trust, but actually the short-term nature of the partnerships is often quickly replaced by more beneficial long-term relationships. The Airbus consortium was created as a multinational meta corporation to better control the allocation of its resources and returns. (see figure 3-3)



3-3 Strong cooperation, weak integration

In the future, so-called virtual companies will schematically respond to three types of behavior characterizing their structures:

- First, virtual professional communities highly integrated in the neteconomy or cybereconomy, for which relations will be mostly opportunist, as cooperation will be versatile or even short-term.. Though not systematically, there will generally be a "deal by deal" reasoning behind these communities. They will use the Internet for business purposes. (see figure 3-2).
- Second, meta corporation-type virtual companies that federate to combine added value, to exchange knowledge or share resources with partners in order to create a "win-win" situation. Their relations will be more structured and more organized to last longer. If these companies use the Internet, the partners more often use value added networks like intranets or extranets to build up more or less integrated professional "inter-communities". These will be discussed in detail later in this chapter. (see figure 3-3).
- Finally, systemic or meta network-type virtual companies will develop more often in an atmosphere of domination where one leader tries to impose itself on a group of companies by using a highly integrating computer system. As a matter of priority, the meta network organization falls within a network aimed at cost reduction through maximum automation. As with meta corporations, network companies seek the most efficient systems performance, the most productive interfaces, but here the quest for integration is more important than the all-out search for winning combinations. Meta networks will more often use private virtual networks (PVN or BBS) dedicated to their trades (see figure 3-4). We'll discuss this type of organization in more detail in chapter 4.



3-4 Meta network of integrated organizations

Obviously all these interconnected entities are not contained within a rigid structural schema. Entire divisions of a corporation can have very different types of structures, as is the case for Benetton. The banking industry, which is destined to become a meta network organization, develops short-term alliances (co-branding) to widen its range of products.

2.2. Benetton's Federal System

Networks characterized by high degrees of "quasi-integration" can be found in the textiles and apparel industry. They are organized by companies like Benetton, in Italy, which combined three distinct elements into one network.

The first element is solid autonomy in terms of design, stylism, and trends forecasting in fashion and advertising.

The second element is highly decentralized production: the seven company-owned factories account for less than 20% of total production. The rest is carried out by 350 small and very small companies and artisan workshops, most of which already existed before joining the Benetton network.

The third element is a very fragmented sales network, structured on two levels, including some 75 companies working for the corporation as agents who take orders, supervise and stimulate the sales in the constellation of retail boutiques established in dozens of countries.

Benetton is a community of 2,500 independent companies owners of the network's 4,200 retail stores. A number of these companies existed before becoming a part of the Benetton network. Though there is no formal link between the group and them, the retail stores must follow the mother company's guidelines concerning style and merchandising, which they receive from their respective sales agents. They are also obliged to order products through Benetton sales agents and can only sell Benetton brand articles. They are not franchises since the brand is given to the stores without any specific payment. The retail stores and sales agents are bound to Benetton by the same links as those that exist between a company and its subcontractors. Corporate headquarters develops the strategies and controls the essential resources of all the autonomous companies part of the system of which the mother company is the leader and principle beneficiary[115].

Furthermore, Benetton tripled its investments in Europe to improve its logistics and distribution at its 7,000 retail outlets in 120 countries. The result was the construction of one of the most sophisticated automated distribution centers in the world. The company thus reduced its logistics costs by 60% in ten years.

2.3. Systems products and services of the future: the engineering of demand-responsive services

Some 80% of department store promotional operations are the result of short-term (a few months or even a few weeks) collaborations among different companies. Rather than focusing on prices, to the detriment of one of the parties (usually the weakest, i.e. the supplier), the companies join forces to attract new clients. Composite goods and services are "engineered" on demand.

Buying a bus ticket and purchasing a vacation package may seem like identical tasks, but in reality these products and services are very different. The first is an act of buying a simple service that consists of exchanging a bit of money for a bus ride. On the contrary, the vacation package involves a whole series of services that may include transportation, dining, lodging,

115"Relations déterminantes entre technologie et économie", OECD, 1992, p.113.

car rentals, sightseeing, and more. An increasing number of all-inclusive vacation packages that offer attractive and accessible services are now available on the market. Generally, they offer worry-free vacations for the customers who buy them, but they require a meta organization to cover the global nature of the services. This is the case with the booming multiservice credit card market, because it enables marketing economies of scale and is an ideal marketing tool to get to know your customers better. American Express, which has worked in partnership with airlines for some years, launched the "Compliment" card together with the international hotel chain Accor. It makes it easier to manage expenses and gives access to a number of consolidated services and promotions. Diners' Club, another credit and debit card, recently launched a combined attack with six partner companies: Sabena, Comfort & Quality Hotels, Hertz, Debitel (cell phones), and *L'Express* (a French weekly news magazine). Nestlé is settling a deal with Casino (supermarkets) to mount an advertising campaign that shows off their respective products. These partnership techniques come from trade marketing and quickly go beyond short-term promotional operations to grapple with more involved collaborative relationships.

These types of agreements will extend to pretty much all the different sectors of activity but mostly to the ones involved in the neteconomy. In fact, it is even easier to create alliances in cyberspace. Webrings consist of different web sites that display links to other related sites. These links make up a chain of complementary services offered by service providers on the web that have formed alliances. Europ Assistance is another good example of the development of demand-responsive, all-inclusive services. This company has a series of specialized subcontractors that work with just-in-time methods, all aware of the importance of their overall effectiveness and the reliability of the logistics needed to perform relief interventions.

"Customized solutions for everyone" is becoming the standard of future business. The case of the Unisys training center illustrates how the virtualization of a company lends itself particularly well to the creation of demand-responsive services, and allows the return to profitability of certain areas that weren't in traditional organizations.

In 1991, the Unisys training center in France generated a turnover of 19 million francs, and included 47 classrooms and some 40 employees, of whom 27 full-time trainers. But the Parisian center was losing around 5 million francs a year, no matter what was going on in the classroom. The operating costs were the same during vacations, while the half-empty classrooms drained on profits. The growing diversification of demands from client companies made it increasingly difficult to keep up. Until the day management decided to virtualize the center by turning it into an engineering training center. The center was closed down. A small team formed around a new director of education, François Elie, who with his team became an interface highly specialized in all sorts of demands for training, for which he handled the logistics. According to Elie, a new economic concept was taking hold: "We used to look for clients who wanted to buy our training products, now we look for products that correspond to our clients' demands." The training team is able to perfect these products with the help of a network of trainers. Thanks to the Internet, the demand-responsive classroom material was delocalized to freelance writers. The training team, formed on a demand-basis, uses classrooms at other training centers, which are all too happy to rent their unoccupied rooms. On site training, which is less expensive, is increasingly in demand. The new managers at Unisys Formation quickly provided mobile classrooms to attract clients who didn't have any.

The services offered also evolved. By becoming integrating, Unisys' training division calls on speakers or trainers outside of its own walls to widen the range of classes offered. As a result it improves its returns. The reduction of overhead and the shift to just-in-time methods, thanks to virtualization, now make it a profitable department: sales amounted to 12.5 million francs in 1996, for a net profit of 3 billion francs. To develop its personalized courses, the team uses the best out of a pool of human capital it had built up over the years. For the virtual company that had now become Unisys' "Client Education Service", using contractorship as an integrating element allowed for economies of scale by calling on a much larger pool of experts than what the company could afford to employ full-time. And the service was better, too. Even though, as François Elie admits, managing the business is a bit more complicated and involves spending more time recruiting and following up with temporary associates.

2.4. Virtual industrial zones: shared service platforms

Traditionally, integration agreements between sub-contractors and their main principals are aimed at achieving productivity gains along the manufacturing chain, to such an extent that factories are often built side by side to optimize costs, reduce delays and improve the flexibility of the entire system by setting up veritable industrial zones. In the long term, these groups of sub-contractors can engender growth poles that propose co-fabricated goods and services to new clients. This was the approach of the companies that participated in the construction of the tunnel under the English Channel. When they had finished, they created ACTE (Association Calais Tunnel Expansion) to continue to collaborate for new work sites, using the skills they had acquired during the construction of the tunnel.

In the future, thanks to their professional extranet, networks of pluridisciplinary craftsmen, formed into meta corporations, will be able to offer all-inclusive services to their clients. This virtual professional community will undoubtedly be the fruit of the insurance company think-tanks currently working on how to improve their insurance products. Like the Spanish company Multiassistancia – 400 million francs in sales and the leading property insurer in Europe – which has built up a database of cooperative craftsmen associations that are called on when a loss occurs. So many professions will use shared service platforms, forming just as many virtual industrial zones.

Today nobody is surprised when telecom platforms handle the after-sales service of one manufacturer in several different states, or for several different manufacturers or distributors in just one state. There exist innumerable fusions that consolidate ready-to-use customer service packages on one same platform. This irrefutable fact will be behind a movement that started in the mid-Nineties: business-specific online service platforms.

They are to cyberspace what industrial zones were to local economies in the Sixties. The establishment of virtual industrial zones is even more crucial as it makes it possible to globalize networks of services and skills. These virtual zones specialize by pooling their regional tangible and intangible resources. They can then better resist competition by forming more creative and economically performing groups. Sésame is a platform that includes a French network of 20 furniture delivery companies coordinated around an intranet managed by one of its members. Organized in a cooperative association, the carriers can envisage reversing the power relationship with the big transportation companies and setting up common services that limit their overhead and consequently their service rates.

The establishment of platforms of highly specialized services is the result of a drastic change stemming from the generalization of online services. They involve organizations that consolidate general services, added value services and logistical support services[116]. They have come to rely on common computer services. The Servius platform, installed at Creusot, allows 80,000 professionals of the banking, transportation and distribution industries to take advantage of a myriad of multimedia services. Its routing EDI makes it possible to inexpensively track its client carriers' shipments. Aware that its clients' needs will result in a demand for more inclusive web-based services, the platform provides messaging services, database consultation, secure payment processing, and lately web hosting services[117]. These platforms provide a variety of options, including the possibility of connecting with other platforms that have the specialists the others may be lacking. According to a study conducted by Ernst & Young, 80% of the companies interviewed consider these platforms a success and claim they have reduced their cost by an average 26%[118].

Platforms subsequently develop to improve communication with markets and customers. The applications rapidly mushroom, each more imaginative than the other. Price lists, catalogs and joint reports are all updated within minutes whereas before this could take days. The work and documents collected here and there by certain collaborators are used when submitting a bid to a tender call. This type of platform makes it possible to offer a bouquet of complementary services supplied by several different providers for a common client base.

Virtual shared service zones serve as a logistics center to reify and facilitate the operations of a professional community of companies: Imprifrance (one billion francs in sales, 1,700 employees) is a group of some forty French printers on an intranet/extranet type network. All the member companies, despite the difficulties one can imagine in this highly competitive market, agreed to unite their respective experience and resources to respond to their clients' demands as quickly and as well as possible. The platform includes common administrative services (switchboard, group purchasing, mailings, etc.) and lists each company's specific services along with the base rates of Imprifrance members[119]. The services available on the web site are accessible to members only, who have their own passwords, but there is a special page for prospects and clients where they can contact any printer directly. Some printers already present their company in this virtual space, while others plan on adding a link to their own web sites. In late 1998, 4,400 visitors had already been to their site, a number that was growing 20% per month, and some fifty had requested price lists. Besides the advantages of using tools that change their entire approach to marketing, the members of Imprifrance are discovering the world of multimedia and the changes occurring in the graphics chain upstream from the printing process. Some intend to adapt their offer, thanks to the opportunity they have been given to put a part of their added valued back into print design.

These specialized platforms provide inexpensive services to members of meta corporations: group purchases, digital archives, secure messaging services, customer services like reception or after-sales service, and more. They act as virtual zones, becoming true service hubs for corporations and territorial communities that cooperate thanks to dedicated intranets or

116"Entre Rhône et Rhin", Revue de la Chambre de Commerce et de l'Industrie, (March 1997).

117Denis Ettighoffer, Le Bureau du futur, les centres d'affaires et de services partagés, Dunod, (Paris, 1994).

118"Les centres de services partagés", Enjeux Les Échos, (December 1998).

119www.imprifrance.fr.

extranets. In 1996, the State of Michigan hired Unisys to build a platform that would assemble into one place its nine federal administration processing centers (including the Departments of State, Interior, Justice, Treasury, Health and Human Services, Commerce and Transportation) to better serve its citizens. The economies of scale amounted to 15 million dollars.

3. How meta organizations create combined value

This story takes place in northern Spain. A Franco-Spanish team visits an electromechanical components factory. The boss takes them around to see his design and prototyping offices, his warehouses, his factory and then, to their great surprise, takes them by car to visit his competitor's factory a few miles away. He explains that together they are confident that they can offer greater flexibility to their principals by pooling their industrial capacities. One of the visitors asks the boss why he took the risk of introducing his competitor to this up-for-grabs market. "If I had been alone you wouldn't have given me the account because I wouldn't have had sufficient production capacity and flexibility." This anecdote, told by Philippe Debacker, former president of Vélo-Solex, is already a few years old. It perfectly symbolizes this new way of thinking the corporation of the future, which becomes a co-corporation with two or more partners, a meta organization.

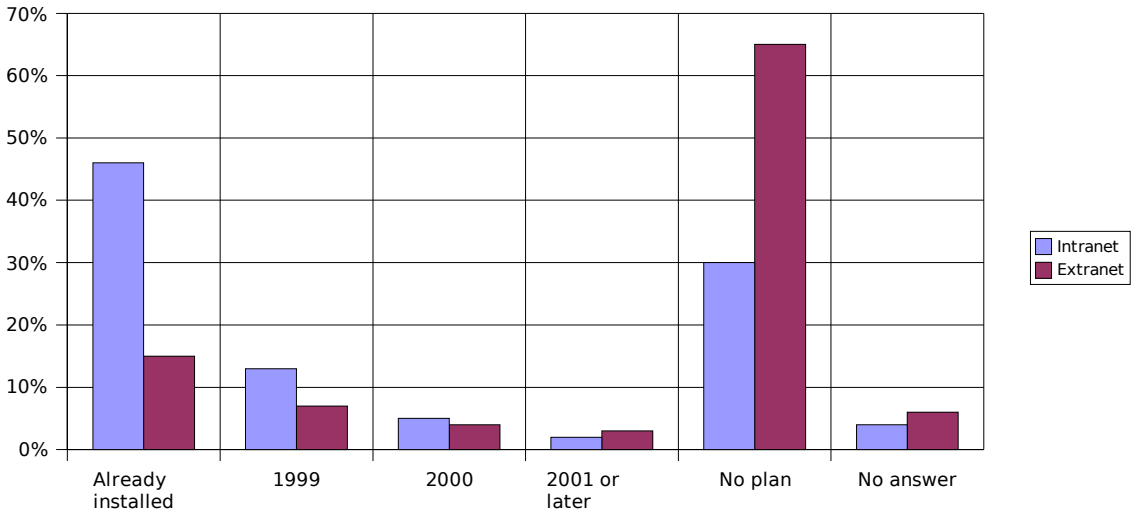
What is new now is the capacity to build veritable virtual commercial and industrial organizations thanks to telecommunications, or alliances that form sales networks of communities of merchants. Australia launched the "Innovate Australia" program sponsored by the Australian Chambers of Manufacturers (ACM). Nearly half a million dollars were expended on this project, which united over 1,500 companies of all sorts in one commercial exchange network. This involves implementing collaborative networks that join together different types of professional communities, first to facilitate their internal exchanges, and then take on the global markets and find a new export window for the members of the association.

Within the new context of virtualization, creating your own community of companies has become a strategic challenge. In 1993, while conducting a study on the organization of computer systems at large European companies, the consulting firm KPMG discovered that only 8% of the 153 companies interviewed had installed a common information base[120].. Though fewer than 10% of Europe's large companies are connected to the web, in France half of all small businesses are plugged into the global sound[121]. All over the world, companies are rushing to get connected with their collaborators, markets and clients. According to IDC, over 18 million groupware licenses were sold all over the world during the first semester of 1999. A study conducted by the OECD[122] in 1997 estimates that 43.3% of Japanese companies were equipped with an extranet type network. But there, as in Europe, the applications are still confined to order taking, reservations, customer service, financial transactions and general information. For executives who want their companies to become the leaders in their fields, the main objective is to form a meta corporation.

120The Economist, (March 11, 1993).

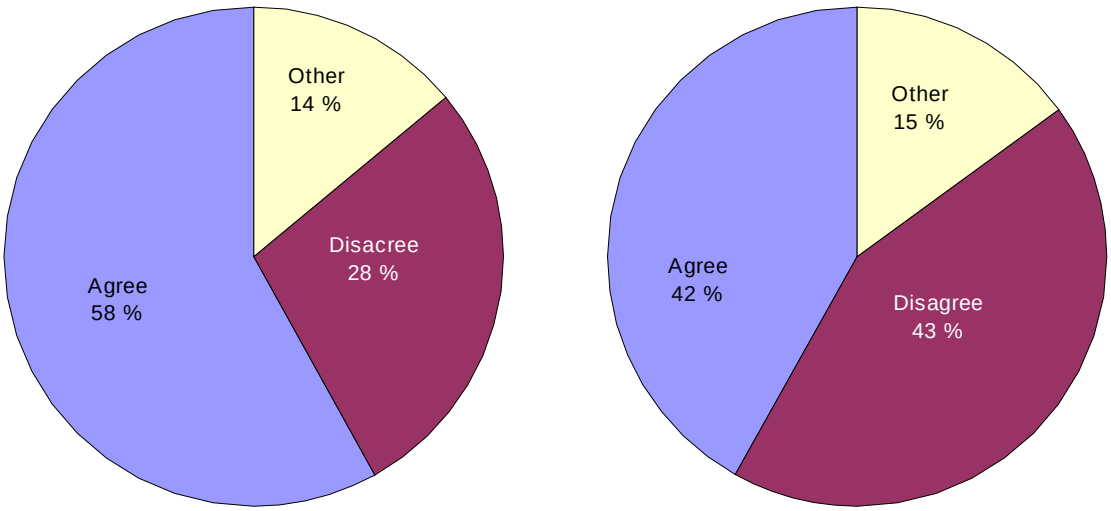
121Study conducted by SESSI (Services de statistiques industrielles du ministère de l'Industrie).

122"Perspectives des technologies de l'information", OECD, 1997.



3-5. Number of intranet/extranet systems forecasted in companies in 1999

Only one European company in three has or will soon install an in-house intranet. Europe's backwardness is becoming worrisome as its installation rate is only half that of the Unites States, which has reached 63%. Germany is the top European country, where 54% of companies with more than 1000 employees have an intranet, compared to only 37% in France (see figure 3-5). The Gallic character of the Hexagon (we Frenchies commonly refer to our country in this way because of its shape) shows through once again, as 43% of French companies refuse to consider opening their intranet to the exterior, compared to 28% in the rest of Europe[123]. This is a scary statistic because it demonstrates the widespread misunderstanding of the use of networks to create virtual corporate communities by opening up to the exterior thanks to extranets.



1231997 Edit Stat survey of 789 large European corporations with more than one thousand employees working on several different sites.

3-6. Percentage of companies that agree to extend their intranet to external users

3.1. The collaborative networks of virtual communities

Ten years ago the need for collaborative networks was pretty much confidential. A 1997 Zona Research[124] study estimated that the intranet market, hotly contested by Microsoft, Lotus and Netscape, among others, would reach 28 billion francs in 1999. Installing a virtual telecommunications network requires relatively low investments, which is probably the main reason behind the spectacular growth of intranets. In fact, in 1998 there were already 45 billion francs worth of intranet networks, largely exceeding expectations, and we're only talking about the intranets of which Lotus claims to control 80% of the market.

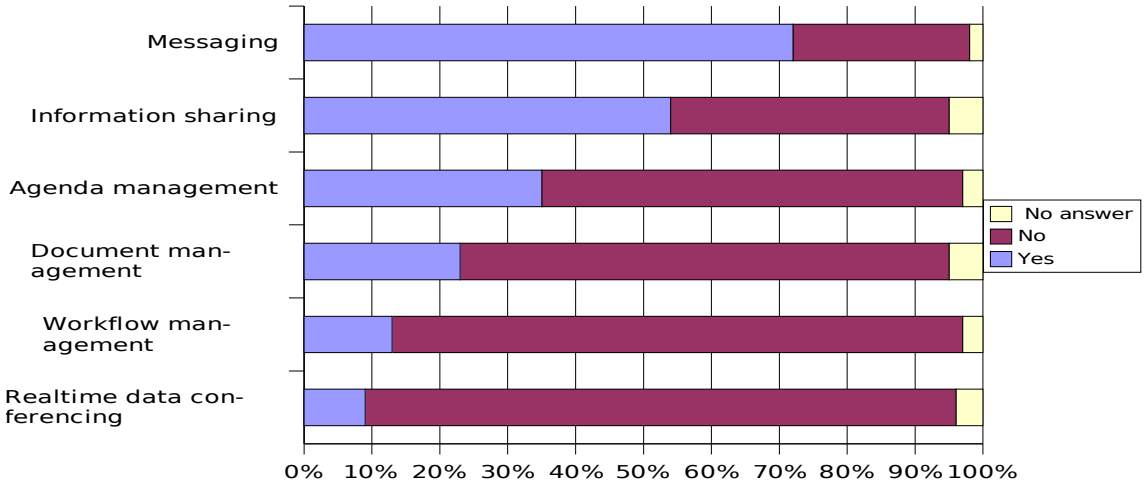
However, does any of this make sense when you consider that the use of systems networks has a much greater impact on value creation and corporate realignments than the annual sales of providers? The generalization of connected computers will have a growing impact on the organizations of corporate clusters. Already between 1989 and 1993 the percentage of computers in the United States connected to a network rose from 10% to 60%. Today, laptops have become commonplace, and modems are increasingly performing. This is an ideal situation for teleworking, increasing knowledge exchanges and managing business remotely. That's why Lotus' groupware concept has been so successful. Lotus is a pioneer in the development of group and remote work software tools, considered the preliminary means for a company to virtualize. In 1999, three-quarters of large multinationals were using intranets. Launched to achieve overall productivity gains internally, the networks rapidly demonstrated that they could also be an advantage in their users' business affairs.

For the time being, the emphasis is on the realization of intranets capable of improving the overall productivity of a company and its affiliates. The headstrongest managers were quickly informed, sometimes on the sly, of the gains achieved by certain companies renewing their organizations. These gains have sometimes been quite spectacular. In some companies the returns on investments have been so significant that consultants are sworn to secrecy. Even journalists say they have trouble obtaining exact figures. Officially, 80% of intranet projects are written off within three years[125]. However, this parameter has to be interpreted correctly.

The executives who embark on an adventure like this have to have nerves of steel because it rarely pays off in the short-term. Even in organizations that are already highly interconnected, a network needs time to reach a level of increasing return. This may be overstating it, but we could guess that it'll take three years to hit the coveted jackpot, that is the moment when the number of services or persons connected is just right to achieve significant productivity gains. Setting up a purchasing system for a multinational with some forty sites around the world and tens of thousands of references requires a lot of preliminary work: standardizing the information base, writing product descriptions, and standardizing the information systems before entering the implementation phase. Finally, the buyers will have to get used to using the intranet purchasing system on a regular basis. All this takes more than two years.

124Michel Kitareff, Les Échos, (October 1, 1997).

125Metagroup survey of some forty American companies whose annual sales are between 2 million and 35 billion dollars.



3-7. Percentage of companies that installed collaboration tools in 1999

Small businesses are gradually getting involved for two reasons:

- In-house intranets are now furnished with a series of applications that format entire functions. They are no longer simple communication networks and telework or groupware networks, they are also a set of applications dedicated to activities in which a multiplicity of parties is attempting to achieve overall effectiveness, like a group of salespeople, prospectors, management auditors or information scientists. The intranet incorporates application-oriented intelligence and makes it possible to centralize and share the information that each needs.
- All intranets are now interfaceable with the Internet, which makes it a tool of the extranet, with safeguards and possible applications (web server, message server, office automation, groupware) extended to several partners with whom the small business regularly works and does business[126].

The small businesses that don't have sufficient internal expertise can use software packages that are interfaceable according to the standard norms. Domino Merchant by Lotus includes an all-inclusive package with which you can build an e-store for yourself or others (anticipate an investment of 20 to 45,000 francs), and even includes links to select vendors like UPS for the shipping side. This concept heralds the development of "package organizations"; it will evolve rapidly by broadening the idea of in-house groupware to the notion of intercommunity on which all meta corporations are based.

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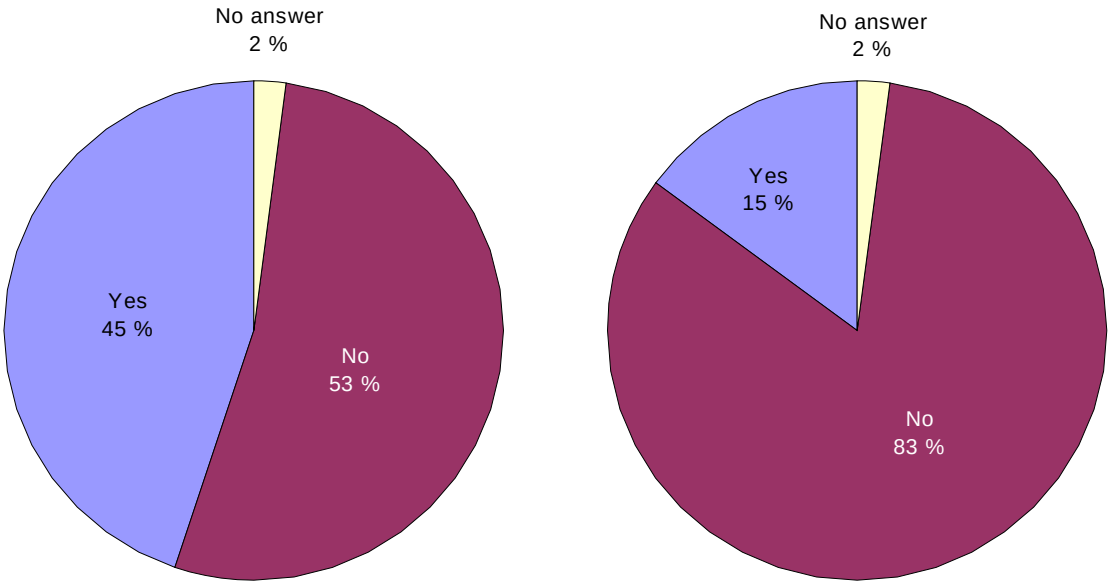
126 % of French companies employing between 100 and 200 persons and 28% of microcompanies with 6 to 9 employees are hooked up to the Internet.



3-8 Percentage of companies that installed an intranet or extranet in 1999

Having become the levers in the reorganization of corporate value chains, intranets rapidly transformed into extranets (see figure 3-7). The capacity of these virtual platforms to facilitate knowledge exchanges among a company's different functions has demonstrated the advantage of extending their applications to the company's relations with its different partners: the concept of intercommunity resulted from this thought process. The SCORE (Supplier Cost Reduction Effort) program, which mobilized the majority of Chrysler's sub-contractors, has allowed Chrysler to save one billion dollars since 1993. The program ensures that the suppliers benefit financially from their participation in cost reduction efforts. The more standardized transactions, idea and information exchanges depend on a Lotus intranet installed on private servers. It will soon be launched on the Internet to include more contributors. In 1997, Ray Hozzie, the creator of Notes, found that the return on investment substantially exceeded even the most optimistic cost-benefit studies.

3.2. Three types of collaboration can exist in the meta corporation

The borders surrounding meta corporations are fading. Meta corporations lead to a blend of centralization and decentralization that is conditional upon the federation of outsourced activities organized piecemeal. These meta organizations were able to form because the cost of coordination and cooperation has dropped significantly with the adoption of groupwork and telework techniques. As a result, the efficient size of traditional organizations has been

challenged. The formation of clusters of companies federated in networks makes it possible to increase the overall productivity of all small companies, without having to consider large investments. Then, the reduction of coordination costs and the gains in extra flexibility this type of organization achieves can compensate for less sophisticated computers. In other words, better organization can compensate for technological weakness[127].

Forming alliances among companies implies abandoning the dominant/dominated model in favor of a new "win-win" concept. This means that the companies mutually respect each other's identities. There are generally three types of combinations:

- co-development: the partners wish to inexpensively access a technology or certain know-how;
- co-production: needed to achieve economies of scale;
- co-marketing or co-distribution: aimed at widening a range of all-inclusive products or services and accessing new markets.

Often, many groups are set up among players that are, or could be, competitors in certain markets and partners in others. Globalization requires enormous amounts of capital, and the difficulties finding and organizing teams of competent employees often calms even the most ambitious executives. In an economy of knowledge, networks allow very small companies to access the knowledge and information bases that make it easier to find potential niches or possible partnerships between companies in different countries. As they don't feel threatened by neighboring competition, small businesses can foresee possible partnerships will less reluctance. In the end, companies prefer to combine forces to develop jointly on a market rather than see both (or all) of them fail.

Furthermore, continual innovation in all fields provides a disturbing context for companies. Bruce Kogut, professor at the Wharton School, insists that it's mostly technological uncertainty that leads companies to form alliances. This is the reason for the increase in the number of technology agreements among firms that, in this way, wish to limit the consequences of drastically re-orienting their activities. Cooperation costs less than global competition.

Many of these agreements are motivated by one of the partner's desire to dominate a market by pressuring its "allies" to align to one standard: theirs. A sort of domino effect starts where the clients of such a group wind up in the hands of the leader, and are themselves subject to the dominant standard. Computer languages, computing platforms, semi-conductors and telecommunications have all been the objects of this type of industrial agreement. The result has been that it is harder for new companies to enter the market, and forming meta organization-type alliances according to the technical standard of channels will be increasingly important on new markets.

127See “L'entreprise réseau, Technologies et Prospectives”, OECD, 1992.

3.3. Co-development agreements promote cross-fertilization

To spark the creativity of his engineers, Ford used videoconferencing with high-speed networks and Silicon Graphics multimedia stations to link its research department with seven other design studios around the world. The possibility of quickly viewing all the consequences of even the smallest change proposed by a member of the network made design work easier than ever before.

Japan's success has often been associated with the capacity of its teams to communicate, to jointly solve the numerous problems any company encounters. Ideas circulate freely, and this favors the continual improvements that have no doubt done more for the productivity of Japanese industry than its automation alone.. Generally speaking, anything that can help facilitate the circulation of information among the players of a same organization can improve its operations, its continuous evolution and the learning processes of each person involved. For example, innovations in global procedures can generally only be the outcome of a series of exchanges among the players involved in the chain, as it's hard to believe that only one could have a good enough overview of the entire "process" or system. The same goes for the capacity to anticipate a company's future: only idea-sharing can lead to a common future for all the players involved.

At the prospect of improving their capacity to work in groups, large research laboratories increased their output by combining into virtual teams. In 1993, Digital Equipment was running, via its Easynet network, a research laboratory "fragmented" into several remote programs. A team of some thirty international executives would select and supervise the research policy, and manage the products submitted by laboratories and researchers from around the world. Numerous researchers who can't travel around as much they would like, prefer flexible research units set up as "virtual laboratories". Hence the development of a programming language for expert systems involved the collaboration of Dr. Shapiro in Israel, Professor Clark of the University of London and researchers from ICOT (Institute for New Generation Computer Technology) in Japan, via a university intranet.

With co-development, anticipated long-term investments can follow along a more opportunist vision, that is to say the use of subsidiarity-complementation to reach one's objectives more economically and more rapidly. Thanks to partnerships, this approach affects price determination by reducing, in the shortest term possible, the costs to access technology or specific resources. Co-development also makes it possible to widen your range by reducing launch expenses. This strategy is even more important in sectors where "industrial" goods and services are subject to short cycles.

3.4. Real time co-production networks

Another consequence of this cycle effect is that it incites a policy of standardizing the production of components (services, products or software) in regions where the manufacturing costs are lowest, and then matching the types of assembly with the types of markets. That's how Toshiba Corp. became one of the leading manufacturers of laptop computers in the world. After having analyzed its manufacturing costs, the firm now manufactures, in partnership with other companies, common, simple and standardized core products at rock-bottom prices. In addition, Toshiba only personalizes on-site what is absolutely necessary, like keyboards and software.

This co-development movement, coupled with personalizing production cycles in real time, transforms traditional companies at both ends of their value chain. On one side, they become specialists in engineering innovative goods and services, on the other, they turn into manufacturers specialized in "one to one" logistics. In a network organization this involves knowing how to use information systems to master one of the two corresponding links, or even both – if not, the organization will fail.

The most successful companies in the coming decade will be the ones that respond the quickest and demonstrate the most flexibility in terms of forming alliances. Co-production will no longer be a matter of production agreements and concurrent engineering. It will materialize in the partners' contributions to accelerating output, in the turnover of raw materials or the production of goods, which in the end optimize the flow of financial resources. The Kanban system has come out of the factories, and is now affecting the entire logistics chain. Orders are taken on the Internet or through particularly performing telecom platforms capable of processing thousands of orders a day. Downstream, the logistics are assigned to groups specialized in express transportation, like UPS. It's easy to see that only an intense use of networks makes it possible to sustain such rhythms. That's why many sectors subject to short cycles choose to join forces. The companies concerned prefer to automate their exchanges within a meta network-type organization rather than opt for a highly collaborative yet under-integrated organization like the meta corporation.

But you don't necessarily have to be highly integrated to shorten cycles. You just have to transform them by proposing a simulated good or service: a realistic, complete representation that can attract enough clients so that all you have to do is produce or supply on demand. With this type of sales it will be possible to propose variations of real or fictitious personalizations in order to gain added value, like the Opiacolor company. You could even show different types of packaging. In short, you can personalize sales even further without having to keep a lot of stock, or face excessive marketing or commercial risks in narrow, yet fragmented, markets that are sometimes hardly solvent. For some activities shifting to online on-demand production by proposing virtual services is a chance to reduce risks while spectacularly improving profit margins. When you consider that distribution accounts for at least 30% of a product's retail price, demand-pull businesses have the advantage of charging for virtual products and services that still haven't cost much money. It's easy to find tailored shirts, personalized CDs, computers in electronic catalogs or demo software packages that you pay for before actually receiving them. The concept consists of reversing the flow: you no longer sell a product to your client, you manufacture the product your client wants – or at least you try.

3.5. Co-marketing and co-distribution to gain market shares

There is a new form of cooperation among competitive meta organizations: the co-marketing concept, which is the result of the first attempts at online shopping malls. Since they couldn't find enough skilled workers, and couldn't mobilize internal resources, companies turned towards specialized organizations that "industrialize" all sorts of online services, especially commercial, on behalf of third parties. Car sales on the Internet intersect regularly. According to the JD Powers firm, 5% of these sales could be concluded through this channel. But it was actually the fact that 40% of sales are influenced by visits to their web sites that persuaded Ford Motors in the United States and Fiat in Europe to invest in Internet sales[128].

The challenge is to increase this influence over consumers for the benefit of the network, instead of skirting round it. Some manufacturers consider setting up Internet sites with a direct telephone link to a call center so visitors can contact their local dealer with a click of the mouse. General Motors recently contracted a Chicago area firm to design and install satellite-linked booths in shopping malls to hasten transactions.

Since it didn't have the know-how needed to sell vehicles on the Net, Ford Motors recently acquired an interest in CarPoint, Microsoft's specialized web site. On its site, the software editor offers an all-inclusive service ranging from the choice of model, to a wide range of possible combinations within a given model, to financing options and contacts with the dealer that will follow-up on the sale and maintenance of the vehicle. Don't get us wrong; this does not involve online sales – which remain rare. They're more like derivative services. They're the work of a network of allied companies that help make a manufacturer's site more attractive, and build the loyalty of prospects or customers. These auxiliary services are used strategically to attract customers.

The customers of these specialized platforms expect very elaborate services. Not only does the administrator of this type of platform strive to improve the performance of his or her e-store, but also its capacity to reach and attract new customers. Instead of shopping malls, which merely pool technical resources and provide a bit of publicity, clients will turn to very specialized companies that can provide added value to intermediary dealings by using some very sophisticated tools.

Companies become meta corporations by joining forces on a platform that then becomes one web site, a shop run by one leader that centralizes and sells their products grouped under one specific theme, like food products from around the world. This virtual professional cooperative offers particular services (order taking, web site animation) in order to build up a community of customers. This organization pools prospecting costs and multiplies the access points that attract cybercustomers, in the hopes they will order something in the end, or at least leave enough personal information for the company to be able to create a customer file and sooner or later follow-up in the most pertinent manner possible. This is how network service providers build up their businesses, with these pools of customers (or virtual communities) to whom they will be able to propose a range of goods and services in partnership with a growing number of carefully selected manufacturers.

128M. Kitareff in Les Échos, (January 10, 1996).

Today, the globalization of the economy encourages these meta corporation-type alliances in which cooperation is strong and integration weak. World Media Network includes in its network some thirty European newspapers with the purpose of creating promotional events that are then rebroadcast on the world wide web. This common name pulls considerable weight with the media. The World Media Online web site is consistently one of the ten most-visited web sites in the world. The business and advertising power of the group only adds weight to its co-marketing agreement. The famous stockbroker Charles Schwab, with 4.5 million customers and 2 000 billion francs of stock under its management, has adopted this approach by opening its online brokerage platforms at investment banks throughout the world – Crédit Suisse, First Boston, JP Morgan and Hambrecht – so that the latter can more efficiently distribute their stocks. In exchange, Charles Schwab customers will be able to buy stocks, in real time, at issue prices lower than their post-listing value.

These applications of "cooperative business" make exporting easier for small businesses. For small companies, the cost of entering a foreign market, often dominated by large corporations or local companies, is often exorbitant. Only a strategy of forming global alliances, made easier by intranet and extranet applications, offers some outlook for the development of global trade areas. The meta corporations that develop co-marketing agreements secure territorial distributions where they alone remain dominant. That's how Sysdis in France (20 employees) works on producing software with Abacus in Switzerland, Powerflex in Australia and Data Access in the United States. They all rely on telecommunications, and each of the partners does its own marketing in its area of influence.

4. Forming a meta corporation or virtual business community

We all know what "community of interests" means. When John Sculley was president of Apple Computer, he was pleased with the contributions of the myriad of designers with whom his company worked. Each dollar earned by Apple resulted in two or three more for its external partners. For him, this form of interest community enabled Apple to remain slender, agile and adaptable[129]. Organized around a common vision, the partners were able to help Apple through rough times. In a melting pot of ideas and suggestions, what looks to some like chaos can become favorable opportunities for others. This is where we find business relations networks, now favored and facilitated by the power of telecommunications, which once only involved a small economic and political elite. The business community develops an economy based on the relationships of a network of entrepreneurs in one gigantic, planetary groupware whose aim is to build wealth that is useful for one and for all.

Cultural, ethnic, scientific and trade diasporas have always resulted in the formation of communities out of the historical need to preserve the identity of dispersed peoples. They act as instruments of cohesion, as a place to share common values and memories. In the age of electronic networks, they become a way to share information and power, an instrument for exploiting market requirements in a new type of homogeneous entity: professional communities. After the Bretons, the Luxembourgers, the Corsicans, and even the Mexicans,

129Alvin Toffler, Les Nouveaux Pouvoirs, Fayard, (Paris, 1991).

Chinese or Israelis, whole corporations can foresee – now that they're all set up on Internet networks – doing business among one another, and then jointly proposing their goods and services elsewhere, even to other communities. It could be described as the creation of an economic ecosystem that includes all the economic sectors, which participate to a greater or lesser extent in its performance or wealth. This orientation favors the creation of wealth through transactions with long or short-term partners.

But let's not get too idealistic. In the Eighties, Matsushita got into trouble with its subcontractors, who revolted against their major principals by joining forces. Things have changed a lot since then; Matsushita redefined its relations with its partners as "high productivity through total wisdom", and set up a cooperative information and work share network (intercommunity). Kozaburo Sikata, president of the association of Matsushita subcontractors, believes these practices will become commonplace because they make it possible to better withstand highly competitive situations. Alvin Toffler, who told us this story, says you can be sure that now, as powerful as the company may be, the executives at Matsushita will listen to the 324 vendors that formed a community of interests.

There is a series of preliminary terms and conditions you should have in mind when setting up a virtual community. One of the problems meta corporations face is the global optimization of retail prices; often the strongest partner pockets all the profits at the expense of the weakest. Therefore, there are some serious limits to the development of certain clusters of companies that don't know how to optimize their operations, much less their prices. The solution can often be found in the notion of client contribution. It's the company that leads the client, which gets an extra bonus and adds to its market share and operating margin. This formula strengthens that of the links in the chain, which then, through its marketing actions, holds a more profitable position within the virtual organization. If one of the links misuses its power over the rest of the value chain, the whole system can fail. The major weak spot of virtual organizations is sharing out resources when setting prices or sharing profits.

This problem is definitely one of the reasons behind the transformation of the Airbus company, once based on the meta corporation model and which is now a more traditional joint stock company. Cooperation will remain strong while the integration among the various components of the meta organization will become more pronounced.

Though they should never turn a blind eye to the difficulties of such an endeavor, all 21st century executives should ask themselves how to create or become part of a meta corporation. The latter shouldn't be confused with a business community, whose success will be reflected in the growth of its members, therefore its capacity to reduce its per unit operating costs and then achieve increasing return should it conduct trade negotiations with other communities or with an external organization. In short, these meta corporations must accomplish three objectives:

- shape a common destiny, share a common culture or values;
- be of economic and social utility, favoring sustainable development;
- facilitate access to and sharing of knowledge.

These meta corporations will be carefully engineered to fill the requirements for skills and resources within the professional communities, like the ones at Apple or Reuters, developing in numerous sectors of the economy. This will involve a common destiny and notoriety, common brands, common strategies, and competitors that will be nothing less than other virtual communities. The proliferation of these communities will eventually raise the question of how the key factors of competitiveness will change in a networked world. These meta organizations will form leagues that will clash in fierce, yet silent, power struggles to win or keep their customers, who for their part will have formed buyer communities. In the cybereconomy of the decades to come, new strategies will drive the competition among these leagues. Incidentally, it won't take long for the big leagues to carry a lot of weight in the economy, a bargaining power that will be used in numerous fields, including politics – but that's another story.

4.1. The common destiny of virtual communities: global groupware

Why is groupware enjoying so much success within international companies? Because virtual professional communities embody the reality of the relations among its members. The world leader in construction materials, the French company Lafarge, still had a small town attitude, as few employees were actually involved in the company's globalization. The need to rub shoulders with the company's other high-potential employees first favored exchanging jobs, but management quickly understood the limits of in-house talent swapping. It could only be sporadic with 65,000 employees in 65 countries. For international conferences, the need to exchange ideas on a regular basis, and promote friendly competition among the various regions – especially to favor innovations in the technical sectors – was the opportunity for the company to take the plunge by implementing Lafargenet in 1997. This global intranet took off quickly, as management had made provisions for a technical support team that made the system even more valuable to the businesses that led the movement. The implementation of online messaging services, forums and technical databanks for everyone eventually won over the company's 15,000 employees, who used the network one year later. Lafargenet staged a small cultural revolution by developing its own in-house professional community.

With its intranet, Lafarge created within its professional community a sense of belonging that didn't exist before. The employees working in other countries are no longer just a vague idea. They participate in forums and send emails. Incidentally, this raised the question of which language to use on the network. A worker on another continent isn't really a stranger anymore; he or she works with his or her colleagues on the Lafarge cybercontinent. Soon, as in other firms, like BASF, these co-workers will use video tools, which serve as real-time discussion tools to further facilitate the collaborative work among the various sites, to accelerate the decision process, which then becomes collective.

Whereas the new virtual organizations are just now becoming better known, global knowledge exchange is not a modern invention. In Europe, following the renaissance, the first knowledge communities were the scientific communities. This concept of sharing intellectual

efforts to collectively advance science and progress is an example for many companies. Each is aware that the risk is shared and that the result, if there is one, will be rewarding for all. Linux never would have been created in the offices of one company; it could only exist within a virtual community that makes common interests its interests. That's why, in an intangible economy, you shouldn't trust your old-fashioned pilot reflexes.

4.2. The collaborative network to counter the lack of expertise

The boom of these networks of professional communities is often confused with learner-oriented networks. Remote collaborations between brands and their customers, to help improve a product or service for example, fundamentally change work processes. In a traditional organization an individual faced with a momentary problem will try almost always to work it out all alone. Asking for help would mean not being good enough, or even incompetent. Furthermore, nine times out of ten, he or she doesn't even know whom to ask for help. This problem doesn't even arise in a virtual organization because it is based precisely on communication and sharing to be more efficient. Transactions can be very brief and informal. Networkers generally know who can answer their question or, at the very least, who can refer them to someone who can.

Virtual communities also abound with a variety of diverse collaborations, for profit or not. It is often within these communities that you'll find groups of companies and self-employed workers who remain independent while they build strong business relations and cooperate to solve problems or start a project. These relations can be short-lived, or prove more durable in time depending on the circumstances. In the beginning the entity has no well-defined legal form.

So there are certain profiles of individuals who favor networking and partnerships better than others. These individuals, who bridge the gaps among diverse organizations and favor their eventual symbioses, are often self-employed or managing microcompanies. They have no other choice than to market themselves by networking intensively on professional networks that are beneficial to their clients. They should have a policy of openness to new professional contacts, even if they have to learn how to manage temporary partnerships. This involves being available and open-minded, which is rarely the case in traditional companies where the tribal relationship with the chief is stronger than its relations with the market, customers or the exterior. Furthermore, the traditional hierarchy doesn't leave much room for these "independent" self-employed workers who don't really belong to any tribe.

Often companies live with these temp "mercenaries", sometimes because they can no longer survive without them, so that they evolve positively and get ideas and innovations from the outside. It's a community of artists, mostly temporary partners, who create the incredibly original and diverse watches marketed by Swatch, world leader in its sector thanks to incomparable creativity and innovation. Swatch comes out with two collections a year, with 70 models per collection, for a total of 140 new models. To do this, Swatch appeals to a myriad of artists and designers from the four corners of the world. The designers agree to stay at least six months, but turnover is still significant, few staying more than two years.

The power shifts in these new types of virtual organizations: at the political, economical and trade levels but also in terms of the job market. Becoming a member of a cooperative community not only involves certain economic advantages, it means penetrating a network of business deals and skills that includes a growing number of talented individuals who work for several employers, and often conduct personal projects with other members of the community.

4.3. Creating a business community: minimum investments but different attitude

Becoming a member of a business community doesn't take much. You don't need an address book chock full of contacts, you just have to change your attitude towards others to build hubs towards other areas of expertise. Of everything that's been said and written about the subject, nothing seems more important to us than these three rules, which will enable you to compensate for weak technological integration and small size through strong cooperation[130]:

1. know the magic number that enables you to enter into contact with the entire world, while gearing down so you don't have to run all over the place for nothing;
2. drive your intranet with open, attractive projects;
3. make the best of the leverage effect, and use hubs to create your meta corporation.

Wanting to meet too many people is useless. Executives have always known how to surround themselves with people who have all the right contacts. In every field there are people like this who can open the doors to networks of influence. Are you familiar with Erdös' number? It corresponds to the minimum number of persons you should know to enter gradually into contact with people all over the planet. Two researchers at Cornell University in New York attempted to uncover the mechanism behind the way this contamination spread. They isolated a "relation fractal" that reduced to six the maximum number of common ties in the entire world. They called this fractal the "small world network", which they discovered by studying the connections and degrees of clannishness of three types of networks: the "network of neuron connections in a roundworm (nematode)", the number of covalent connections in an electrical network in the United States, and the network of relations of several Hollywood actors. Their work consisted in demonstrating how the structuring of these networks made it possible to reduce to six links a world that had been considered as much vaster and more complex[131].

Generally, we find it very difficult to imagine the power of a network organization's relations or its capacity to contaminate. Imagine, as Bruno Martin-Vallas[132] suggests, that you are in a country with a population of one billion. One morning, one of these inhabitants arrives at the office around 8 o'clock with some surprising news, which he announces to four people within

130See also John Hagel and Arthur G. Armstrong, Bénéfices sur le Net, Les Éditions d'Organisation, (Paris, 1999).

131Article in Nature, New Scientist, re-printed by Courrier International, (July 1, 1998). According to Nature, Researchers at Notre Dame, in Indiana, came up with the same result. They specify that, while there are over one billion web pages, with nineteen clicks you obtain the average distance between two documents on the web.

132Prolific author of nano-books and indefatigable heckler of established thought. See, inter alia, Histoires citoyennes (Nano-Éditions, Lansargues, 34130 France) where you can find the calculation of the result.

her first hour at work. Each of these people rushes to tell four other people within the next hour, and so on. Each person who hears the news tells it to another four people within one hour. The question is: how long will it take until each person in the country has heard the news? The answer is: everyone will have heard it that same day by midnight. Now imagine the country with Internet.

It's not hard to become a member of a business community, but you have to want it. When you consider the absenteeism of certain executives at business meetings, it's easy to see how, isolated and knowing they'll stay that way, they are less competitive than those who network heavily and take care of their business relations, including on electronic networks. Remember, the companies that develop the best are the ones connected to the Internet, a network that boosts their capacity to collaborate with third parties. These companies have understood the importance of the business networks developing on the web.

4.4. Hosting your intranet network as if it were an extranet and treating your employees as if they were your clients

The second rule has to do with the ability of a team to mobilize people with an attractive project. The success of an intranet doesn't depend on the technical quality of the network (though it remains indispensable), rather on the group's interest in communicating and collaborating on a project. Even for internal use, the approach is very "marketing"; you have to have a good product and some advantages to offer, which correspond to a particular need. In short, you need some kind of motivation. A lot of people have understood that innovations and the need for efficiency involved intense collaboration. Many find it hard to believe that they could be only a tiny fraction of a project that involves dozens, even hundreds of participants. Exchanges remain infrequent because we are deeply conditioned by the fact that certain cultures or nations have favored a very selective education process, which consists of separating individuals according to their status. That's why it's so important for network administrators to offer motivating challenges, new services, like the launching of Lafargenet, or to invest in forward-looking programs, which may be out of the ordinary, in order to get round any initial hesitations.

All too often the intranets installed by systems departments are only an excuse to demand more work. The result is that people think of the intranet more as trap or a new constraint rather than an advantage. Or else it becomes an advantage for a small number of people (the managers) and a disadvantage for everyone else. To avoid failure, you should avoid building up an egocentric professional community, focused on itself, which usually leaves the impression that it's only an extra instrument of power for the managers. "The intranet offers an absolutely incomparable level of quality and responsiveness among different players[133]." "But mostly it's the intranet's capacity to build lateral relations that generally strikes project managers. They make it possible to get round the hierarchies, in a more or less official manner, to invade the territories of certain department heads, and set up interactions among players that are more dynamic than the traditional administrative procedures," remarks Philippe Mangapian, director of internal communications at SNCF (France's railroad company).

133Journal du Téléphone, August 1999.

The solution is to make your intranet as customer-oriented as possible, which will later facilitate your cooperative relations with partners and clients at all levels. In plain language, the intranet should be seen as an extranet, by instilling a "client product" orientation in companies that are still far from having this mindset. This concept involves accurately identifying what types of services are expected, and how much need there is for internal transactions. The trick is to avoid creating an ossified professional ghetto. This intranet-extranet opening will become a valuable tool in virtual organizations where there are numerous internal and external participants. In France, the installation of a professional extranet revolutionized the work of notaries, who were producing tens of thousands of different deeds (notaries in France have a more official and professional status than those in the United States). In doing this, the heart of their community no longer resided in one particular firm; it encompassed all the representatives of the profession, the location of the server having become secondary. The community of notaries was able to mobilize the entire profession because it endeavored to set up common remote services. The French notaries' council allied with a specialist in electronic signatures to be able to offer the authenticity of a contractual electronic signature. The 1,500 or so notary offices using the intranet, out of the 7,700 existing notary offices, can now guarantee the security and confidentiality of the deeds transiting the electronic highway.

For companies that no longer have their classic borders to guide them, the extranet can become a means of action for the traditional wide-reaching corporation, the virtual corporation, the meta corporation, and even the virtual community. It just goes to show the importance of the intellectual stance you should take toward the challenge of integrating a company into the neteconomy. Not only will companies need to ensure efficient internal transactions but also effective external transactions with their markets.

The virtual communities of notaries, accountants, attorneys, florists, and apparel manufacturers are all groups of meta corporations that rely more heavily on extranets than on intranets. The functions of "intercommunity" are organized horizontally and intersect among companies that may be linked by telecommunication networks. Virtual organization may be temporary at first, made up of differently sized and structured independent entities. Usually the relationships consist of functions that have been delegated and assigned by each party with the purpose of reaching a particular, precise objective, which may eventually result in the development of more structured shared services and procedures.

4.5. How to use hubs and leverage effects to develop your meta corporation

By using hubs and leverage effects to develop your meta corporation, the leader becomes no less than a ringleader who mobilizes small units of highly integrating production units, powerfully motivated to increase the number of all kinds of transactions. Their relationships are triangular.

- They favor their relations with knowledge pools (schools, old school buddies, professional associations, discussion forums on the Usenet), sometimes participating in training initiatives or creating associations.

- They take a great deal of interest in customer relations. They regularly attend seminars or they pick out the managers who are loaded with prospects or future business relations. They are constantly present on specialized business forums (marketplaces, specialized web sites), making their work and references known over the Internet. They become event or project organizers to attract attention, putting the emphasis on their hubs (specialized press, publishing houses) and their key influencers.
- Finally, they conduct shared interest transactions, frequently using the buddy system, with other business partners. They provide their partners or allies with micro-networks of specialists, companies that are contracted according to the type of mission or project conducted. It can take years to build up an address book like this, which explains why an increasing number of individuals or companies end up in professional communities.

By participating in Netdays, launched by the European Community in 1997, Lotus Corporation got involved in a strategy of supporting projects dedicated to online training. Netdays is an intercommunity-type platform that supports on its server over one hundred training projects launched by members of the European Community. The team in charge of the platform project includes more than thirty-five thousand participants and five thousand events organized for the Netdays event held on November 13-21, 1999.

These coalitions are short-lived, but with time and a good atmosphere of mutual trust they can turn into long-term relationships without suffering from the structural rigidity of a closed system, like in a traditional company. Although they have access to common technologies, these companies stand out for the way they interact with their sub-contractors and partners. Some intercompany alliances aim to develop their common knowledge by conceiving innovations, new concepts, package deals or all-inclusive services. Meta corporations combine their know-how with other organizations by forming veritable virtual conglomerates. Scandia, a financial services multinational, is organized as a virtual corporation, managed by teams of specialists who not only cooperate but manage some thirty allied companies apiece[134]. This federative structure, like Reuters', limits the tangible and intangible investments inherent to a traditional organization.

Generally it's the chief executives who launch a partnership project in more or less constraining and formal forms. Third parties also get involved in forming these clusters of companies. To reduce the cost of prospecting export markets for a group of companies in Upper Savoy (France), the local Manpower agency provided a specialized professional charged with prospecting South American markets. Specialized in plastics cutting, punching and injection molding, these small sub-contractors for the automobile industry agreed to share the cost of prospecting foreign markets. Manpower invoices the services on a pro rata basis, and puts its Brazilian office at the disposal of the person recruited for the job. After an initial adjustment phase, and after having tested its prospecting formula for four months, the three companies formed the group Alpech so they could send the expert back out on mission, this time for two years.

The approach is pragmatic, and the protagonists barely even notice that they've just formed a strategic alliance. Mostly they're opportunist. The most organized establish a number of co-branding agreements and partnerships. An attitude like this offers many possibilities to meet

134L'Observateur de l'OCDE, n° 211, May 1998.

people and collect sensitive information. It's also necessary to resist the temptation to over-formalize the structure of a virtual organization, which is first determined by the attitude of its management staff. Then, you have to avoid another trap: making telecommunications the top priority in the organization of meta corporations. In the Alpech example it is clear that the role of the technology network is secondary. In other words, technology shouldn't overshadow organizational innovation. Today almost everyone performs his or her job using telecoms. Traffic costs don't really matter much in the concept of virtual communities – except when building virtual industrial districts – or, as we'll see further on, in the very different concept of meta networks.

The system of continually structuring and restructuring a meta corporation works by the appeal of its business plan or purpose. A business is economically appealing when it is believed that it could access new markets that would otherwise be inaccessible. The most attractive mission statements have to do with joining forces to better resist the pressures of a large principal, launching an event of interest to the public or favoring local development.

The formation of a community of companies doesn't always proceed along a clear, orderly line. Outside a well-defined core, the rest of the entity may be a bit fuzzy, as the economic players come and go, sometimes very quickly. Wanting to control all this from the heights of a central authority is pretty hard because the managers remain too individualistic. The French executive officer of Unicooptrans, which has been attempting since 1995 to group together a few small transportation companies, wonders "if they (the carriers) would prefer to die alone rather than live together[135]." The capacity to accept partnerships will be a crucial key to success in the coming years. The solitary "cowboy" of the business world, who still haunts the pages of certain management magazines, is a thing of the past.

4.6. The meta corporation must compensate for its weak integration with a strong culture of collaboration

As we have already seen in the example of the airline companies, these meta organizations can be structured two ways: in meta networks or meta corporations. The nature of the participants' activities can be important when forming a meta corporation. For example, the comparative importance of payroll expenses, which can affect a company's competitiveness, will incite the latter to establish more agreements with companies in countries where labor costs are lesser, hence margins greater. To do this, it will use teleinformatics networks to delocalize towards a partner a part of its least added value wage costs. In 1995, Lufthansa decided to recruit 10% of its flight attendants in Asian countries, and transfer 30% of its maintenance to Ireland[136].. Gradually, the virtual organization thus formed is reconstructed through more or less specialized links running all along the network. In the airline industry these alliances sometimes present certain advantages for customers: integrated connections, frequent flyer miles, competitive rates, etc. However, agreements among affiliates can sometimes block the process of reducing prices, which had definitely fallen too low after the sector's brutal deregulation. They especially have the distinctive feature of globalizing fleets and personnel, which will make it easier to withstand competition by increasing the use of flags of convenience, as in the shipping industry.

135Interview in the April 21, 1998 edition of Les Échos.

136L'Expansion, July 9, 1995.

There is a different side to these affiliations, and the redeployments they enable. Employees find it hard to accept that yesterday's "enemy" is today's ally, that certain tasks are transferred abroad. In our example, the early stages of an alliance between America West and Continental were a bit chaotic. The behavior of their employees was a discredit to both companies when it came to sharing out their domestic flights. In Houston, the employees of Continental favored their flights over those of its new ally. And the America West employees did the same. It took more than two years for the two companies to iron out their problems[137]. So, you can't forget that alliances must be seen with more or less structured – or at least very progressive – functions and levels of integration, and very precise rules.

In these organizations where the creation of added value and overall efficiency depend on the capacity to make collaborate, the behavioral analysis of individuals and organizations will be of significant importance. Previously considered as an indispensable part of the modern manager's '"proper" education, increased interactions through technology communications channels will reopen the debate on "hot" and "cold" vectors and how to maintain a positive attitude in employees who don't work for the same company yet subject to the same market conditions. To do this, technology networks will have to become vectors of shared emotions. Internal communication is changing. Sharing rewarding experiences isn't as hard as we thought. In a small Franco-American company, a gong sounds every time a contract is signed anywhere in the world.

We will also find more or less competent managers trained to use groupware and communication tools to lead and motivate their teams. But just because someone has an MBA doesn't mean he or she is an effective manager. Collaborative tools are still pretty basic compared to what we'll see in the future with the multiplication of remote management tools. Screens will display images, sounds and graphs, to illustrate, demonstrate, work and learn how to create communities of emotions, within groups and remotely, in much better conditions than we have today.

4.7. The keys to success of creating a meta corporation

Forming the clusters of companies that belong to a professional community within a dedicated extranet depends on factors, mentioned earlier, that are pretty easy to identify but hard to put into practice:

An atmosphere of trust. For a long time, immigrant Lebanese, Chinese, Armenian or British merchants around the world created virtual communities. They were based on the mutual trust needed to do business but also to achieve solidarity. As interdependence becomes stronger, the community of companies must share a common objective, a common destiny.

137 Courrier International, March 11, 1998: translation of Scott McCartney, “Les compagnies s'unissent pour le pire”, The Wall Street Journal, New York.

Some are concerned about losing a technological or commercial advantage, but they run the same risk outside this type of community, too. Drug Abuse Sciences (DAS), a biotechnology start-up fighting drug abuse, was founded by French and American doctors. DAS owes a part of its success to its capacity to share out its research work to other laboratories as the need arises. DAS then uses the results it receives to progress the fight against drug abuse[138].. When meta corporations practice mutual aid and cooperative work, it's usually among well-identified members and more often within specialized and professional networks.

The ongoing problem is preserving the balance between the freedom associated with partnerships and the respect for certain operational constraints. This means having to cut down on certain uses of open communities to collaborate with third-parties: for example, to launch a new, highly innovating product, begin a widespread operations analysis, launch a targeted recruitment campaign, etc. In a matter of hours, all your remotely organized competitors will have decoded your future strategy.

A decompartmentalization of functions and borders. All department managers, as well as those who always want to handle everything themselves out of pride or who fear being seen as incompetent, should assimilate the notion of subsidiarity and the quest to provide complementary goods or services. Each should be able to identify the person most competent in his or her field, besides him or herself, and then ask themselves if they accept to collaborate with this person.

We are witnessing the growth of new forms of intermediary organization. Thanks to their networks, some have developed the distinctive feature of knowing how to "knit" together the most diverse skills, often within very specialized niches. Rather than keeping highly skilled human resources available internally, these "intermediation" organizations, familiar with light engineering, are likely to mushroom.

Specialized in the art of obtaining the investments needed for innovative business models, this network of individual persons, which has some clout with just about everyone, organizes a quarterly business development grant for all its members, as well as its financial and business partners[139]. These forms of intermediary organization are so specialized that they can take over a function that would be handled inadequately by one or several small businesses. Taking charge of the purchasing function for a group of companies is one of the examples mentioned by RIOST[140], European observatory specialized in outsourcing, when citing the foreseeable development of service outsourcing platforms.

A culture of exchange and the capacity to detect opportunities. Installing a telecommunications network offers new possibilities, but it doesn't make people anymore open to each other than they were before. Thousands of miles of copper won't inspire someone to communicate if he or she doesn't want to, if he or she doesn't have anything to say. In his contribution to *Le travail au 21e siècle (Work in the 21st Century)*[141], the

138 Les Échos, March 14, 1998.

139 Les Échos, October 7, 1997.

140 Riost Office, 12 avenue Minerve, 1190 Brussels, Belgium. The European Commission recently published a guide on intercorporate cooperation.

141 Collectif Eurotechnopolis Institut, Le Travail au 21e siècle, Mutations de l'économie et de la société à l'ère des autoroutes de l'information, Dunod, (Paris, 1996).

philosopher Pierre Levy argues in favor of collective intelligence "engineering", which he calls the economy of human qualities. Exchanges with vendors or customers should be dynamic, and their goal should be increase the quality of the goods and services offered. The question is knowing whether you want to collaborate with such and such company to reach a precise objective; to know whether, instead of competing, you prefer to use the leverage of an alliance that will yield know-how and capital.

Virtual communities become an instrument of value creation when they contribute to the development of opportunist actions. Cooperation tools facilitate skill sharing, and increase tenfold the productivity of knowledge. But mostly they increase the number of contacts that result in business encounters.

Always be ready to adapt your business model. The success of Dell Computers, now the second leading PC distributor in the world, hangs on its choice of organizational and economic model, which ran counter to traditional models. Remote sales on the Internet boosted its service offers and its sales (+70% in 1996 here in France). There on the company's web site, users can buy a personal computer with personalized options, and there are also a myriad of technical support services, like software updates or trouble shooting. Nevertheless, you can't just imitate the leader anymore, as strategic reorientation depends directly on the inventiveness of a company's organizational models.

The way Pact Group has adapted its business model over the years illustrates the flexibility needed to run a modern corporation. Pact is an international software company that, in 1993, merged with an American company that had development resources in the Caribbean islands. Pact Group, originally located in Lyon, set up operations in Southeast Asia so it could draw on its entire organization, spread out over three continents, in accordance with production constraints and its clients' locations. In 1987, Pact Group was already using the American messaging network MCI, then switched to Business Talk from General Electric. The company had to strengthen the coordination of its resources distributed around the world, and transfer enormous files among its sites. During this period, cost analyses shifted imperceptibly from labor costs (compared value of payroll expenditures for computer specialists) to the cost of telecommunications (better use of off-peak hours and promotional rates). Later, after installing electronic mail and forums, the cost of the computer system (which had fallen drastically) became secondary because the knowledge exchanges among co-workers (favoring groupware applications) had become preponderant. This progressive change mirrors that of thousands of companies that have to continually update their analysis of their value chain; it's just that once it would have taken Pact Group half a century to evolve whereas this transformation due to NICTs took less than two years.

5. The strategies of the cyber economy

With the new forms of organization made possible by virtualization, the curve of strategic reorientation is so unexpected that everyone is wondering where the competition will come from. As a result, executives are becoming paranoid. They're all focused on one objective: keep as many customers as possible by expanding their offer of goods or services, perhaps with the help of partners. For them, the strategies of the cybereconomy consist in winning

over a growing number of customers or partners by practicing the theory of increasing returns through "contamination", and getting in the way of competition by draining the resources needed for its development. Others often wonder if some start-up out there will invent the economic model that will kill their company. Start-ups continuously challenge economic models. As well they should.

Amazon.com and Barnes & Noble currently communicate through their respective lawyers, as Amazon.com accuses its competitor of technological copyright violation. A dramatic turn of events in the burgeoning history of the new business strategies. The competition among communities will eventually give rise to exciting battles, perhaps silent and definitely full of dirty tricks like electronic sabotage. We are shifting from competition among traditional corporations to competition among virtual meta organizations. Plus, the ways of competing have changed; now it's up to the shareholders and customers to decide which company has the best economic and organizational models.

The classic power relationship doesn't hold up anymore; companies have to invent a killer application or virtual business model that helps the company stand out in its market by providing a real service to customers. The main purpose of these services should be to earn money and prestige.

In short, there are three possible strategies: contamination, resource depletion or the creation of an economic model that supersedes the competition's.

5.1. The strategy for increasing the communities' return: contamination

Many of the changes in progress aim less at economies of scale than gaining pools of new customers. We're shifting from a business community orientation to a marketing-oriented community. This strategy is accessible to flexible companies that can accept that their borders are fading, and they must start to collaborate closely with others. They attach less importance to their possessions and more to controlling the market.

Thanks to the effects of networks, the old-fashioned dogma of decreasing returns and economies of scale is being replaced by that of increasing returns. Microsoft and all the other companies that have understood the "contaminant" effect of a network economy know how to use this strategy. With significant development costs but low production and distribution costs the software industry gains shares in captive markets by supplying free software packages, to better sell other versions or complementary services later. The contamination strategy was developed to broaden communities of customers: affiliates or webrings are used to increase the number of contacts with new cybernauts. The companies recruited will improve their commercial results, and the customers will find more attractive offers. The strategy consists of providing the affiliate with services (tracking, telemarketing, web site management, etc.) and a ready-made web site (excluding technical support) in exchange for which the visitors sooner or later go to the community leader's portal site.

Virtual communities interest meta corporations because they represent an increasingly important marketing power and the hope for better returns. Different economic players join forces under one leader's banner, often at a portal web site. For example, Women.com is a site that generates several million dollars in advertising and referral sales. This virtual community approach dedicated to a profession or community of interests has a lot of possibilities..

Companies meet in public or private forums, in BBSs to do business together, discuss current events pertinent to their professions, or use sources of information they or their professional associations have collected. In France, that's how the Grain Companies of France group federates its members who make up the entire professional chain: the seed company, the grain company, the consumer associations, the researchers, the professional training centers. Within the community, groups work on subthemes initiated by members of the network. Consumers are invited to participate in the forums. This strategy of using the leverage effect of virtual communities breaks with traditional methods. It forces companies to adopt a very aggressive attitude towards winning market shares. Executives have very quickly understood, by way of the business models of the cybereconomy, the advantages of creating a portal to channel the maximum number of teletransactions towards one virtual space: their service platform.

What is disturbing in the theory of increasing returns is that they can rapidly have anti-competitive effects by cornering entire sectors of the economy. The phenomenon is self-supporting: the increasing returns that improve the productivity of the whole also serve the interests of the members of the economic community. The unit markup price of a service can drop, or certain extra advantages can be offered in accordance with the number of visitors, which further fuels the attractiveness of these sites. A real monopoly can settle in, which for a long time will block the entrance of new competitors. To get the initiative back, competitors will have no other choice than to federate in turn, to compensate for the size factor, by forming a meta corporation and inventing a new economic model, adapting their strategy to the new competition arising among meta organizations.

5.2. The strategy of the leagues of the future: depleting resources

There are two kinds of strategies liable to thwart the development of competing communities: containment or depletion. To contain a virtual organization, communities sharing common interests will stop competing and begin to form alliances, using standards and encryptions that will make exchanges among networks less transparent. When General Motors launched MAP (Manufacturing Automation Protocol), the Commission of the European Communities launched a different standard (CNMA) that included the largest manufacturers in the European Community. The boom of BBS-type private networks is a symptom of certain communities' desire to safeguard their interests, to protect themselves from the tracking on business networks, or attacks by the competition or other communities with which they are in conflict for business or other reasons.

This is the strategy that air carriers follow when they attempt to control the most hubs possible. They deplete local resources in an attempt to limit the competition's traffic. In the coming decades, the Internet traffic controllers who control traffic volumes, hence download speeds, and the owners of crawlers who enable switching among sites will also have a strategic role in containing or depleting the technical resources dedicated to any community. In the cybereconomy, it's the crawler managers or electronic traffic controllers who occupy a strategic position in the formation and exploitation of business communities. Electronic crawlers are at the core of online service strategies. They affect traffic routing for services on platforms, they ensure the best use of infrastructures and available bandwidth, they differentiate preferential connections (use of "private virtual network" tunnels) or different routing priorities while facilitating the tasks of network administrators.

Sooner or later the question of how dependent meta corporations are on specialized traffic controllers will arise. Client companies won't be able to afford to limit themselves to comparing rates or checking out new services that guarantee high speeds and optimum security. They will also have to focus on their business and technology strategies. The development of meta corporations adds an extra dimension to the problem of collectively managing databases and skills and business distributed among partners and other affiliates. The explosion of the demand for high-speed bandwidth dedicated to information exchanges will make it indispensable to store data on networks, and group data warehouses into storage subsystems. These in-house or independent warehouses will preserve the data collected by the meta corporations, administrate, secure and exploit them in accordance with precise specifications dictated by their clients. All the applications, the developments of e-business and its value added services will depend entirely on the strategies of network providers.

For the latter, mastering telecommunications infrastructures is becoming a bigger challenge than the competition among BBSs[142] or leagues of retailers. The price of high-speed bandwidth dropped 99% in just ten years[143]. While providers offer convergent and interactive digital services on one side, the residential and professional demand for bandwidth is exploding on the other. Capitalization in these infrastructures is considerable and often reserved for the heavyweights of the older providers. In the next few years, we will see sizeable capitalistic alliances between providers and service companies, like what is happening today with the big networks[144]. They will divide the cybercontinent into communities of interest united for better or for worse. The big "star war" will soon be under way in this cyberspace occupied by the private sector, at times neglected by public authorities, and most often circumvented by domestic providers. This conflict will be even more spectacular as sometimes entire sectors will face off on meta networks, on intelligent networks.

Even if it doesn't seem immediately apparent, this dependence will most likely cause quite a few problems some day. The financial stakes are enormous, more than the GDP of the majority of OECD countries. The network providers will have to join forces with merchant communities (when they aren't the provider's themselves), with the risk of client companies getting involved in the conflicts of interest among these new leagues. Furthermore, when you consider that, for reasons of cost optimization and economies of scale, the provider circulates multimedia (voice, text, fixed and animated images, graphics, etc.), multiprotocol (HTML, XML, etc.), hypermedia (composite documents composites from several sources) and multiservices (transit hubs or platforms for multiple online services) on one circuit, you can't help but wonder about the power of the carrier on infrastructures and of the traffic controller on crawlers. Moreover, the concept of a "single window" at one sovereign provider, who reassures the client, is a lazy therefore dangerous organization.

142 Bulletin Board Services. Network or discussion forums that can have reserved access.

143 Observatoire des techniques européennes de communication, October 21, 1999.

144 The gigantic merger between Cartlon Communication and United and News accounts for 36% of all advertising sales and reaches 37 million television viewers in the United Kingdom, compared to the 7 million subscribers to Rupert Murdoch's television empire.

Finally, it's possible that in case of system problems, the provider's backup routing systems might damage the majority of its clients' services, especially those dedicated to small organizations that have less weight on its economy, to better preserve the major accounts. Whatever happens, the future of virtual corporations involves the diversification of their alliances and the use of multi-providers.

5.3. The bypass strategy: finding the killer " virtual business model"

It's hard to enter a market where a competitor has already built up a virtual trade community. Competition also develops through a company's capacity to design the most imaginative economic models, even if it means using a combination of organizations that can serve as a leverage point to access market shares rapidly.

Online auctions, where the buyers quote the prices, already look like one of the economic models that will destabilize traditional online commerce the most. According to Forrester Research, they will be worth 12 billion dollars by 2003. The leader of the market, eBay, makes capital out of this development with its pool of 5 million visitors and 33 million transactions conducted in 1998 alone. eBay recently widened the gap between it and its competitors by signing an agreement with AOL that gives it access to the latter's 18 million subscribers (as well as Time Warner's), which indirectly adds to eBay's goldmine of advertising spin-offs: the average cybervisitor spends one hour per week on the eBay site, double the time of comparable sites. Faced with this crushing domination, the site's competitors have no other choice than to unite under the banners of Fair Market. This federation of companies, which includes Lycos Microsoft, Excite Home, Dell and some one hundred lesser-known sites, built a webring that "re-routes" visitors towards Fair Market[145].

The battle, which in itself won't leave many victims, won't make news for very long. Why? Because the alliance didn't invent a new business model that could destabilize eBay's situation. When virtual communities or clusters of network companies compete, apart from buying out the troublemaker, the traditional power relationships don't work; only new ways of conceiving wealth-creating organizational models will do the trick. In its first four months of activity, Freeserve, a Dixon affiliate, attracted one million customers to use its free online services. Successfully introduced on the stock market in 1999, Freeserve, its new business model in hand, profoundly destabilized the providers that had set up shop with formulas whose success depended essentially on subscription revenues. During that same time, other companies increased the number of subscriptions offering a "free" computer with every hook-up. This enabled Infonie, in France, to gain a pool of several thousand customers in just a few weeks. The strategic lever can now be found in the capacity to destabilize an existing model by replacing it with a new one: yours.

For lack of having understood this, some companies involved in the neteconomy were surprised by how rapidly the economic models they had used when they launched had evolved. Business and management schools will soon be bombarded with interesting case studies. Certainly the banking industry will be in there somewhere. After quite a few problems, it finally embarked in the online banking adventure, and seems to have some problems with its attempts to set up the electronic purse. The current device is expensive for

145Michel Kitareff, Les Échos, September 20, 1999.

both users, who pay charges for both a credit card and a purse, and stores, which pay an extra commission. In fact, it only offers advantages to the bank. The banking sector is still stuck in a dominant model and many companies don't seem to have really gotten the measure of the strategic changes in progress, especially the distinctive feature of the most successful models: the ones that make money for the customers!

To gain market shares as quickly as possible, you have to build up communities of customers rapidly by using the attraction of a highly differentiating service that has strong values and/or very distinctive advantages[146]. For example, inventing a service that protects electronic messages and destroys them after the recipient has read them.

Companies innovate every day to find a niche in the cybereconomy: sites dedicated to weddings, television shows or movies engender a multitude of derivative products that turn a chocolate maker into a TV show host. Unlikely, we said when speaking of the new economic models. Unlikely but true, as true as the development of the high-performance integrated systems that will constitute intelligent meta networks.

146To boost visits on behalf of the under-12 crowd, Foxkids recently launched a campaign where any company that addresses kids pledges not to do or say anything that could physically or mentally harm children, not to incite purchases by exploiting the inexperience of minors, not to incite them to push their parents to buy, and not to place minors in dangerous situations.

IV. META NETWORKS AND INTELLIGENT NETWORKS

"The future is already here -
it's just not evenly distributed yet!"

William Gibson,
science fiction author

It's a courageous hen that lays hundreds of eggs each year. She'll help fill one of the numerous poultry crates in which her chicks will be taken away by truck in an incubator. Along with his supply of feed, the farmer will receive thousands of new chicks free of charge. Forty-five days later, when the chickens weigh 1.9 kg, the standard for poultry processing plants, he'll send it all back. Everything runs likes clockwork: the mortality rate, the feed stock replacements, the chicken turnover (an average 6 batches per year) to ensure sufficient returns on the investment for the incubator, and the battery-run machine to fatten up the chicks, like the ones used for calves. Everything is closely supervised, the growth rate of the animals is standardized, and the role of the farmer reduced to that of just another link in the chain of no added value. For that matter, it's the person who supplies all his chicks and feed, the processor, who guarantees the investment in his farm and on whom his business, his job and his revenue depends. If there's a bad recession, the farmer will be the first fall guy. The organization is integrated, efficient and highly productive. Contrary to meta corporations, which are highly cooperative and weakly integrated, companies structured into meta networks are forced by certain constraints to be highly integrated.

These constraints enable financial gains and considerable hyperproductivity, which benefit all the players in the chain. The chain can function totally or partially on autopilot, limiting human intervention thanks to the use of automation tools and computer applications that consist of a series of "ready-made" components available to business owners so they can conform with the technical-organizational standards of meta networks.

Constraints in certain sectors (packaging, distribution, food, car manufacturers, etc.) are the result of a symbiosis among several organizations integrated into one network. The overall competitiveness of the whole depends on the quality of integration into the community of companies thus formed. The arrival of computer networks enables the improved productivity of the interfaces among the various organizations, by optimizing the material flows, logistics, and responsiveness of the whole as much as possible. For example, Dell wanted to modify its organizational model so it could assemble custom built computers: it adapted its logistics to reduce its inventory while increasing the turnover rate of components coming in from all over the world. Now the company's inventory turns six to ten times faster than its competitors', its storage areas are minimal, and the number of days between the receipt of an order and its

delivery has fallen from fourteen to two days. In short, the company reduced its overall costs by 33%. In addition, the generalization of business-to-business applications makes it possible to reduce the administrative expenses of business transactions by 100% to 1000% while reducing payment terms. This overall systems productivity is widespread throughout the world. It frees up significant amounts of capital invested elsewhere.

The concept of meta network is found in the integrated company. Each company participates in the productivity gains of the whole by agreeing to increase the number of common automatic controls. This eventually results in an intelligent network capable of interpreting events that would otherwise be indiscernible. The meta network is autonomous: it can anticipate new market trends and customer demands, as well as the need to replace stocks. To do this, it studies an array of indications like requests for information or documentation, the number of visits to specific websites, or discussions taking place in particular forums. In ten years, there won't be anything coincidental about the enticing offers cybernauts find in their inboxes.

To further gain in productivity, these meta networks will increase their use of tracking applications. At first tracking will concern objects, then information, which will be exploited and interpreted directly by the artificial intelligence applications installed on networks. The latter will then be able to interpret the weak signs that give precise meaning to information that is incomprehensible to an individual drowning in a deluge of electronic data. These intelligent networks will see through hidden logics, and render intelligible a considerable mass of data from around the world. As often as possible, they will exclude human intervention, the weak link. This exclusion will be due mostly to the rapidity and security needed to adapt to the constraints of real time and our impatient society. Humans will be excluded as much as possible from meta networks for another reason: with the electronic deluge, it's no longer possible to rapidly process and interpret billions of data. Meta networks will transport us into the age of hyperproductivity.

In anticipation of this era, the providers of integrated solutions will multiply their “package” offers, which will consist of ready-made organizational tutorials: a gold-mine of organizational intelligence, stuffed into a single software package, will teach executives how to get organized to achieve significant productivity gains.

Sometimes there will be a high price to pay for this hyperproductivity. An analogy can be drawn between the boom of meta networks in the service industry and the plans for a totally automated factory. We know that this automation had to be partly revised and corrected, and that it was limited voluntarily to reduce systems errors. The difficulty in managing the system will lie in the choice between a “clusters of companies-type” alliance policy, made up of virtual communities, and a meta network-type professional integration policy that can destroy jobs. The “chicken farmer” dilemma can be resumed as follows: dependence in interdependence or interdependence without dependence?

1. Systems hyperproductivity: the challenge of economic restructuring in the 21st century

In 1991, the introduction to the UK of a new clearinghouse automated payment system (CHAPS) wiped out the jobs of 6,000 messengers in a single day. The same happened in France where checks are now processed digitally with optical scanners, and are less often subcontracted, which has resulted in job losses at the data collection and input levels. The entire check processing chain has been automated, eliminating the gaps between tasks and, notably, human intervention, which explains the considerable productivity gains. But that's nothing compared to the deadly competition of electronic brokerages for traditional brokers who have to deal with costly overhead. Today in the United States nearly 25% of all transactions pass in transit through online markets, skirting round traditional stock markets. Led by Merrill Lynch & Co. and Barclays Global Investors, nineteen of the City's financial institutions announced they were joining forces to create the electronic network e-Crossnet, which would save them 80% on their transaction expenses. As in the case of Kokusai Securities in Japan, this approach involves reducing the number of employees and agencies by half.

Forecasts remain bleak; specialists predict that over two-thirds of all brokers will lose their jobs. Automatic brokerage platforms will soon be available 24 hours a day, like Instinet and NexTrade, to allow investors to play on the electronic Exchange outside the New York Stock Exchange and NASDAQ opening hours. The European stock exchanges, which detect the danger, are trying in their turn to join forces by creating a Pan-European electronic Exchange to counter the American networks. Instinet, the trading division of Reuters, launched the offensive on the European markets by acquiring the platform of the British Tradepoint, which could operate continuously. In the end, these systems become competing meta networks that will need to reinforce their anti-crash measures. Regulation systems will then be used, this time for added security instead of profits.

1.1. Meta network: the advent of the integrated corporation

We say that a company is integrated when it is highly integrated into one operating and organic system shared among several partners. In exchange for productivity gains and guaranteed sales or purchases, it gives up a part of its functions to the system, thus losing a part of its sovereignty and free will.

In 1991, Reebok's annual sales amounted to 3 billion dollars, or two thousand times its weight in the Eighties. This meta organization includes more 2,500 retailers and specialty stores, each of which uses the EDI run by Reebok Hong Kong. The “Reebok connection” is no more or less than a cluster of network companies, an association of affiliated organizations forming an economic business community highly integrated into a computer network. Reebok chose a meta network organization to gain productivity and overall flexibility through strong operational integration. This approach follows in the footsteps of the big manufacturing projects developing all over the world.

The IMS (*Intelligent Manufacturing Systems*) project was developed in 1993 on the initiative of the president of the University of Tokyo, professor Yoshikawa. A few years later it involved the United States, Japan and Europe, quickly joined by Australia and Canada. The United States then launched the *Coalition for Intelligent Manufacturing Systems* (CIMS) project. For lack of government funding, the companies involved were invited to seek funding from R & D agencies. The success of IMS was undoubtedly due to the fact that small businesses were able to take part in the project by accessing special financing. According to the OECD, "perhaps never had such diverse and numerous group of private companies worked on a common cause, and rarely, perhaps never, had governments adopted such a determined and constant attitude towards international industrial collaboration"[147].

Globeman 21 is an industry integration project that implements intelligent manufacturing systems (IMS). Little known outside the manufacturing world, IMS, which involves the entire international community, is considered a one-of-a-kind initiative. The experimental part of the project, launched in 1995, involves dozens of industrial establishments around the world and interests the entire value chain, including end consumers. It's piloted by the private sector with the support of the governments, which encourage international research consortia to find responses to the technical and economic challenges of manufacturers in the 21st century. IMS are employed in three domains:

- The development of a virtual manufacturing environment to reduce the lapse of time between the design phase and the start of production. For example, design a virtual product, test it, and sell it before launching production;
- The flexible adaptation of allocations of autonomous manufacturing resources to the origin of the orders (reduced logistics costs) and local availability;
- The organization of the global infrastructures of information technology needed to enable IMS.

The objective of the "holonic manufacturing" project is to develop continuous and discontinuous manufacturing systems based on highly flexible, agile, reusable and modular manufacturing units. These systems will be composed of autonomous, cooperative and intelligent modules capable of automatically reconfiguring in response to new system demands and/or to the introduction of new components. The goal is to invent a manufacture that plugs into a meta network just like information technologies do: plug & play. Other projects study the distribution and integration of intelligent information technologies to pilot a virtual company composed of resources shared out on a worldwide scale. Some try to reveal their effects on the methods of designing and rapidly perfecting new products on the network, on the standardization of the models needed for die stamping, and determine the implications of the man-machine relationship.

In the end, there is a concept of a global, innovative, self-reconfigurable factory capable of intelligence to self-adapt and run itself. The meta network factory will be equipped with numerous sensors that will enable it to perform self-diagnoses and anticipate future problems.

147For more details see Science Technologie Industrie (STI), OECD, n. 23, 1998, p. 244.

To do this, the network will have to have become “intelligent” thanks to the use of applications that extract and interpret data. Do you think this is possible in your service sector? Do you think it's unlikely? Will we make the same mistakes as the managers in the Seventies who said it was impossible to “mechanize” or “industrialize” services, and who also thought that only secretaries would ever use micro-computers? In a few years we'll feel the impact that the application of these “learning-intensive” meta networks in the industry and services sectors has had on the global economy. The IT systems of the traditional goods and services sectors will be totally re-organized; these sectors will develop hyperproductivity.

1.2. The role of meta networks in the American economic miracle

The impact of these meta networks on the economy is recent. It's the result of the gradual transformation of our manufacturing and distribution systems due to the interpenetration of functions among various organizations aimed at achieving overall economic efficiency. Optimizing the use of capital (fixed assets) through inventory management is a well-known practice among executives and economists. Varying the volume and value of inventories has gradually become an economic factor that could weigh heavy on a company's accounts, and on an economic conjecture. According to Philippe Chalmin, it could eventually account for “over half the growth rate of the GDP, and in itself be the cause of a recession, like in 1993, or a recovery, as in 1994.” Limiting stocks throughout the supply chain enables savings in storage costs, fixed assets and corresponding finance charges, not only within the company but also along the entire demand and supply chain[148]. Then there is a significant macro-economic leverage effect. This is one of the reasons for the economic “miracle” in the United States[149].

This “miracle” is one of the results of the hyperproductivity made possible by the installation of highly integrated IT systems. It is the fruit of the concerted effort of companies to reduce the cost of administrative transactions, which had skyrocketed over the last few years with the development of the service sector. The business-to-business concept totally virtualizes the entire supply chain and the processing processes of their value chain. Nestlé cut the storage time of its finished products in half, Essilor cut its storage time by 10%, and Alcatel reduced its delivery faults by 25%. Each link in the chain, from manufacturing to delivery, was optimized. Logistics management packages were proposed as modules to automate warehouse operations management and material flow by increasing the possibilities of configuration. The productivity of these integrated organizations was much higher than the sum of gains that each individual unit would have achieved. This approach was even more profitable when it included all the exterior partners contributing to the logistics chain. It became a way of differentiating a company through prices. McKesson's success depended on the fact that it

148In 1992, an estimation of the Rexeco firm showed the intermediary inventory size was equal to 30% of France's GDP, compared to 22% in the UK and the US and 18% for Japan and Canada. Courrier International, n. 86, June 25, 1992.

149American productivity had been increasing steadily since 1992 (+ 7,4%). During the fourth quarter of 1999 it reached and annual rhythm of + 6.4%. This growth makes relative labor costs fall and limits inflation, which results in incremental wealth.

shared its productivity gains with its customers: 45,000 pharmacies, or more than 80% of all drugstore retailers. This company provided its customers with a mini-scanner that conducted inventory controls right there in the store's aisles, and automatically sent orders to the McKesson computer system when necessary. So the order prepared overnight arrived the next day at the retail outlet, which claimed to save one day of work per week.

In 1997, Lectra Systèmes, worldwide specialist in cutting and molding machines, installed an extranet to drastically cut down the time and efficiency losses among the various professions involved in the manufacturing process between the moment a model is launched, cut, and shipped to the customer. Today this client can present its model on the Internet, and help, again on the Internet, design and pilot the cutting machine depending on its own customers' orders. In other words, Lectra Systèmes deals directly with the value chain of its clients, which can go from design to sales without having to manufacture in advance.

After some years of indecision about how to interpret the changes in progress, it's clear that the general industrialization of services boosts overall productivity, which pulls the entire economy. The price to pay for this is the increasing automation and specialization of systems that, contrary to the contained automation of the Seventies, will link entire economic sectors, and use a great deal of artificial intelligence applications to render these networks autonomous.

1.3. The reorganization of companies into meta networks mirrors that of the economic sectors

At the same time as the development of clusters of companies, we're also witnessing an increase in the number of companies linked by one main computer system. In the late Eighties, entire sectors were forced to organize into large systems entities to preserve their competitiveness. Problems with materials flow management were the cause of a 25% profit loss in the garment industry in the United States. Between 1988 and 1992, the range of products grew by 63%, while style obsolescence was accelerating[150]. At the time, Liz Clairbone Inc., located in New Jersey, was a giant of the apparel industry. In 1994, the expanse of its distribution networks in the US and Asia was becoming a handicap. The company was becoming less able to respond effectively to even the smallest of problems, and its inventory levels were way above the norm. So the company launched the Lizfirst project with the goal of reducing its inventory by 50%, and the length of the main processes by 25%. Two years later Liz Claiborne had achieved 70% of its goal, and reduced its operating costs by 100 million dollars[151]. This was the result of having installed a global telecommunications resource that connected all the company's departments; it makes it possible to reduce the design, modification and production cycles of the models, thus increasing their seasonality. An ISDN type network links the stylists on the East Coast to the production agents in the Far East. Today, altering a model is as easy as sending a photo or digital video to Hong Kong.

A growing number of co-production and co-marketing (co-distribution) structures operate almost entirely in real time thanks to NICTs. Following the concentration of R&D-intensive industries over the last decade, now entire sectors of industry are gathering into meta

150Perspectives des TIC, OECD, 1997, p. 204.

151“Global Innovation”, Computer World, July 1997.

networks. The majority of acquisitions between 1991 and 1995 were carried out in the pharmaceuticals industry, the banking sector, the electricity production and distribution fields, the telecommunications sector, in transportation logistics (rentals, roads and air traffic), the hospitality industry, and in the food industry, according to a UK study conducted by Richard Schoenberg and Richard Reeves[152]. According to the authors, though some companies acquire others to broaden their range of activities, size is no more an essential criterion (as the oligopolistic approach has yet to be established) than the growth of capital intensity. However, deregulation highly favored intersectorial concentration.

As the limits imposed by US legislation[153] on the right of banks to join forces to become competitive were lifted, the structural reform of the global financial sector accelerated. Conglomerates formed that, from the universal multi-specialty bank to the highly specialized network, established themselves on vertical niches by optimizing their collective information systems. By merging with Sakura in October 1999, Sumitomo became the second largest banking interest in the world. This merger followed that of other banks around the world. The media is buzzing with the most imaginative hypotheses, to such an extent that it's nearly impossible to tell fact from fiction. These mergers require standardized computer systems that integrate the maximum number of applications and souped-up automations to develop their electronic marketing and online services and brokerages. When the trends of the sectorial reorganization are revealed, it will very probably be quite a shock. Entire economic sectors will be under the control of big global networks highly integrated into one computer system. The current concentration phase has less to do with a capitalistic reorganization, which anyhow is diluted among multiple shareholders, than with a pooling of companies into meta organizations destined to become as performing and hyperproductive as possible.

The dictatorship of the consumer, combined with the power of the shareholders, is remodeling the economic pattern of the 21st century[154]. Consequently, the enormous financial reorganization in progress contributes to a dynamic and permanent reorganization of the international value chain, by forcing modern economic systems to look anywhere for the most inexpensive production possible and sell it, with some added service, wherever it will achieve the best margins. This type of business management subrogates space and time for the ultimate purpose of maximizing profits through the intensive use of computer networks in order to preserve the best economic ratio between purchase and sale.

That is one of the aspects of virtualization and the role of meta networks in the cybereconomy. The buyers of the companies will be just as cosmopolitan as the cyberconsumers, who will force an increasing number of firms to set their prices from one day to the next, depending on the whims of the markets, on the tension between supply and demand.

152Senior lecturer at the Imperial College Management School of the University of London and director of strategic development at The Custom PC Company. See Expansion Management, June 1999.

153The Glass-Steagall Act: from the names of the US senators, Carte Glass and Henry Steagall, who proposed a law that basically kept banks from doing business on Wall Street and vice versa.

154Paradoxically, under growing pressure from clients about prices, this trend, if it actually occurs, would dilute the power of shareholders and distributors by helping to bring the bargaining power back to the intelligent networks. There would then be an application derived from the holonic production in the services industry (see IMS project).

1.4. Meta networks are client-oriented to save on negotiation costs

In this perspective, it becomes understandable that managing as vast a client base as possible is essential for preserving margins and commercial profitability. The more attractive the network organization is, the more this will further increase its market power. Banks form alliances with insurance companies, which in turn forge partnerships with real estate developers, which become partners in trade associations, which will have an online bank handle their pension plans, and so forth. There are a number of possible scenarios, of business models, that are now accessible to the business world.

Acquisitions and strong integrations among economic sectors are affecting a variety of activities. It's even conceivable to see a mass marketing network take over a banking company. The Carrefour-Promodès merger was worth 355 billion francs, two hundred forty thousand employees and more than 28% of all mass marketing purchases. These groups aim to adapt to the virtual cybermarkets by heightening their influence on the channels that have become more numerous in order to widen their range of services and products. Amazon.com is in the line of fire. The increasing diversification of virtual bookstores, which now sell music, electronics, toys, and which are getting into auctions and, more recently, franchise shopping malls, worries experts[155].

This phenomenon, which a decade ago only affected a few industries, is spreading to an increasing number of economic sectors. The convenience goods sector is the most concerned by the formation of meta networks. It's not surprising to find automobiles, apparel, textiles, beverages, tobacco, pharmaceuticals, food, cosmetics and more on these networks. These industries account for more than 25% of employment in the OECD zone. The objective for all the players in these sectors is to reduce long-term investments and bench stock to achieve greater flexibility by delivering smaller lots, but more frequently. This involves very synchronized intercompany coordination. It's easy to imagine the importance of systems integration when you consider that Toyota receives five deliveries a day from its ball bearing vendor, and that between 1950 and 1995 the number of items managed daily in a supermarket increased from 2,200 to 29,000 on average[156]. Systems investments followed, dedicated to order processing and customer service in the United States and to logistics problems and order processing in Europe. In 1995, the former invested 2.2% of their annual sales in computer systems and the latter only 1.5%, which, because of the leverage effect, accounts for the better overall efficiency of the Americans.

The convenience goods market is already mature in many countries. All over the world, the challenge is to win clients who remain very sensitive to prices. That's why the distribution sectors are most sensitive to the verticalization of the production-consumption chains. They're overrun by meta networks because their margins have been eroded by the hyper competitiveness among countries. The textiles and apparel industries are labor-intensive activities. The cost of labor accounts for a significant part of a product's total cost. In a fist phase, transforming the value chain consisted of producing in countries where hourly costs were very low.

155ZShops, launched by Amazon.com in September 1999, enables anyone to sell their products online for 9.99 dollars month and a commission. This service already has 500,000 new products available.

156Perspectives des technologies de l'information, OECD, 1997, p. 205.

In a second phase, because of the industries' versatile and “very trendy” clientele, there existed a need for wider ranges and customized production as close to the sales points as possible to limit stocks, which resulted in the significant automation of the links in the chain. Only the big integrated chains like Pimkie, Promod, Zara and a few others were able to preserve their margin thanks to their computer systems. Independent manufacturers weren't so lucky. Their unsold items rate was three to four times higher than the networks that produce as many customized items as possible. These chains increasingly limit their production to the bare minimum. They are organized to produce on demand, a demand they develop themselves through all sorts of advertising and marketing media. As a result, product turnover has accelerated: the Zara stores can thus present two different models in the same week.

Chain stores are no longer competing solely at the production level; they now compete to control the largest markets possible and to offer the most personalized customer service. *In the age of the neteconomy, economies of scale are less economies of production than economies of negotiation.* Instead of being entirely production-oriented, the competition among the various chains is oriented towards controlling the largest markets possible, and towards personalized customer service. As the power is now in the hands of the cyberconsumer, the meta networks must be sufficiently large, must reach a critical distribution mass that enables the profitability of the entire chain. The intensification of technological clashes involves rapidly winning the greatest number possible of users of the proposed solutions or services. This is why, for that matter, computer manufacturers offer service agreements or free software with their computers: to gain a position as world leader as quickly as possible. “As manufacturing costs continue to fall, everything is imaginable, including handing out free computers to sell the software and services that will constitute our profit base,” commented an executive of a large manufacturer, after the announcement of the launching of the first free services on the Internet. “The more technology allows us do things, the more complex it becomes, the more we need services to learn how to use the new technological capacities and adapt our organizations,” he concluded with a smile. In short, services that attract and retain customers are taking increasing precedence over the goods themselves.

1.5. The meta network as an instrument of economic domination

Networks are instruments of domination with which companies attempt to captivate customers and vendors. Wal-Mart is a good example of the flow of functions and professions around an information network, but also the integration into a common logistics infrastructure. The development of the Wal-Mart computer system enabled exceptional growth; annual sales rose from 1.2 billion to 26 billion dollars between 1980 and 1990, reaching 94 billion in 1995, or quadrupling in just fifteen years. During the same period, the number of stores increased from 276 to 1,528 and the range of products purchased and delivered directly by its network included 100,000 different products. Like McKesson, Wal-Mart made investments (600 million dollars between 1987 and 1992) to push its computer automation as far as possible in order to build highly performing systems capable alone of achieving hyperproductivity. Wal-Mart uses handheld terminals, and perfects its network so often that it has been able to reduce its distribution costs to 3%, compared to the competition's 4.5-5%, or annual earnings of around one billion dollars. Direct contact and just-in-time

deliveries to customers reduce warehousing requirements: 90% of the products Wal-Mart delivers never even pass through a warehouse, but are shipped directly from the manufacturer to the store, which limits committed costs. Furthermore, with its purchase information collection tool, the company can anticipate market needs and identify the signs of the changes in progress.

To work better together, the various parties agree to collaborate using a computer network and common services. The economic players join forces in a meta network dominated by one leader, like the American group McKesson in the pharmaceuticals distribution sector[157]. This involves the use of common standards, and encoding as much as possible the exchanges imposed by the leader. Thus the mass distribution sector imposed optical coding on its vendors. The companies that want to gain competitiveness are forced to depend on the tools already used by the leader. In these sectorial reorganizations, what each party gains in overall productivity, it loses in independence.

Along with this process, some players try to dominate in terms of systems engineering (the art of coordinating or federating multiple skills), like the banking sector. The networks are strategic; they are both the instrument of the overall hyperproductivity of all the links, and the domination of one player over one or several others. They also become a stake for nations, because the current evolution of strategy is shifting from technical instrumentation to the exploitation of knowledge databases, which the meta networks are capable of building and managing to their own advantage and to the advantage of their masters.

After having had to delegate material flow logistics, companies must resign to giving up one third of information flow logistics. Added value is created by exploiting the knowledge databases built by these big networks, which form dozens of empires that will dominate entire economic sectors. There will be the healthcare networks, the information networks, the training networks, the financial networks, and others still. The competition among Cap Gemini, Cegetel and France Télécom to respond to the demand for a healthcare network uniting some 300,000 professionals involves a considerable number of challenges: from processing insurance claims, to collating medical data, to establishing special commercial relations with the medical establishment. There will no longer be just companies, but interest groups and networks of companies. Virtual communities or specific meta networks, these big combined and systems-intensive groups, will have their own principles. These principles are becoming one of the major levers in the reorganization of markets and sectors, through the 10,000 alliances established among companies each year.

This intensification of the interdependence among establishments that ensure their transactions at electronic speed, arouses the fear of a systems crash linked to the shortcomings of one or several operators that could compromise the entire meta network. This only increases the resistance of some companies to get involved in these very structuring networks. By using Internet-type networks, they prefer to preserve their “plasticity”. Others choose to become members of a meta network to preserve their margins and their right to work with the strongest players. This often locks them into an owner concept of the meta network, not the one, like in the Seventies, of the computer manufacturers that opened up their systems, but the one of telecom operators that profits from the verticalization of economic sectors.

157See by this author, The Virtual Enterprise or New Ways of Working, (Paris, Odile Jacob, 1992).

The latter take up the owner strategies of the manufacturers, then of certain industrial sectors that dominated and consolidated their vendors with imposed standards (MAP at General Motors or TOP at Boeing). They form veritable corporate networks incorporating the vendors, and sometimes their customers. Each sector can have its own specific machine language (EDI like Gallia in the automotive industry, Cals in data interchange, Geis in mechanics in the US, EdiBuild in construction, Editext in apparel, Édifices for accountants, Électre for publishing, etc.), which is perfect for rendering exchanges more productive while protecting the network from unwanted intrusions. In turn, the operator that owns a private added-value virtual network has considerable power to profit from the increasing returns in a given sector. Therefore, it has a strategic stake in encouraging reorganizations around a single IT system: its own. This would work even better in partnership with an accomplice that practices network facilities management, like EDS.

To get around this possible loss of sovereignty, some companies combine the meta corporation and the meta network approach. They look for a way to benefit from the advantages of large corporate networks without bearing the inconveniences. The market seems to favor less structuring solutions that will satisfy companies that wish to control their own destinies. The problem is that in a number of sectors companies won't have any choice[158]. Joining a meta network will make it possible to benefit from artificial intelligence applications in intelligent e-commerce: the “learner” network that becomes an “omniscient” meta network contributes more to overall productivity, and it also provides added value.

2. Tracking: an indispensable tool for meta networks

Interdependent companies reorganize together to enjoy slim, reactive logistics services, usually provided by a third party that is interlinked in their organizations. The increasing number of small production runs, sometimes customized, makes logistics increasingly important for a number of companies. Furthermore, the development of electronic commerce, which is transforming most of the retailers around the world, demonstrates the growing incidence of logistics on sales; transportation costs can be two to five times higher than the price of the product purchased. In 1998, 76 billion packages were shipped within North America alone. This shows how important, and difficult, it is to trace products throughout the transportation logistics chain.

The analysis of material flows, and the information that goes along with them, provides valuable indications on market behavior. Direct marketing requires precise targeting of potential consumers' behavior. Thanks to tracking it's now possible to know who buys what over long periods of time. This is unquestionably a big asset, and it gives meta networks yet another strategic advantage. The latter quickly seized the data collected to ground pertinent decisions on the events that either affect the supply chain or the demands of the market. From the classic capacity to go along with earnings and earnings forecasts, the “learner” meta network gives emphasis to its capacity to infer coming events.

158 The analysis of the market cannot be based only on the rate of use of electronic data interchanges (EDI): 17% of French companies use EDI compared to only 11% that use the Internet. We should be wondering about the role they play in structuring certain sectors.

The disadvantage is that networks are also vectors of economic unrest, which can affect a trend. There are many causes of unrest: an event that has already occurred in Tokyo but is not yet known in London, a group of differing data and only a few seconds to make a decision based on information that hasn't been verified, or the possible derivatives of hyperreactive networks in meta network-type virtual organizations. In other words, the “butterfly” effect. An everyday event, considered secondary, will have serious repercussions on the cybereconomy, which then becomes a turbulent economy requiring a strong capacity to adapt quickly when necessary.

Despite numerous precautions, the problem of the reliability of information sources exists everywhere. Financial services, where one piece of information can be worth several million dollars, pay particular attention to continuously filtering and analyzing their sources. Moreover, the systems risk is twofold: instrumental as it concerns the organization of the IT backbone and its capacity to adapt rapidly to changing economic conditions, and decision-oriented as it concerns its capacity to face the unexpected by anticipating as much as possible. To do this, network systems will trace information all over to preserve its quality and reliability from its origin. In the end, all this will look a heck of a lot like our idea of big brother.

2.1. Managing complexity in real time involves the extensive use of tracking

The general acceleration of the turnover rate of raw materials and semi finished “off-the-shelf” products required investments in impeccable distribution logistics in order to drastically reduce fixed assets. The Helen Curtis automated distribution center in Chicago employs 225 people and handles twice the amount of merchandise that the six warehouses it replaced could handle, or a reduction of 40% in distribution costs thanks to handling acceleration[159]. These results couldn't have been obtained without using tracking techniques that enable a logistics infrastructure to trace the whereabouts of a product.

Tracking also makes it possible to track the position of trucks, thanks to GPS (global positioning system), and or persons or objects, thanks to sensors installed in key positions throughout a company. That's how express transportation companies and distributors have progressively taken over entire functional areas originally handled by their clients.

Companies delegate this part of their chain to express transportation companies because of delivery constraints that would require investments that are unsustainable in an integrated service. Cisco, a California company, world leader in network materials, enables its clients to order equipments directly off its website. This B2B application, already much used, facilitates the integration of ordering systems among several companies. But what we don't see is that the Cisco IT system functions in symbiosis with the FedEx system, a large global carrier that processes the order. Why? Because Cisco delegated the order management function to its carrier, which uses the Cisco warehouses. The intricacy of the means and functions of the

159Since 1995, the Benetton automated distribution center in Castrette, Italy has reduced the number of employees needed to process 700 deliveries a day from 400 to only 22.

highly interdependent organizations of a given sector is the logical result of the efforts companies have made to further improve overall productivity. Integrated management programs, which generally cover a company's vertical functions, are changing. Under the new term of “supply chain management”, they are becoming tools that can manage and accommodate events occurring all along the supply chain, and almost in real time.

Furthermore, the most diverse activities are increasingly subject to continual changes and disruptions: changing the model of an airplane for a given flight means changing the number and type of meals. British Airways, which serves more than 160 airports worldwide, hopes that by using tracking it will be able to limit the waste caused by ordering 10 million meals for only 4 million passengers, which would save the company an estimated 7 million dollars. This general effort to achieve systems productivity is now the driving force of the global economy. Each party in a given meta network is mobilized to manage complexity just-in-time. Tracking is used to follow ranges of products manufactured for mass marketing. Besides the importance of traceability in food safety, it also makes it easier to follow industrial cycles and set markup prices for each element of a systems chain, as well as improve the scheduling in the management planning of manufacturing chains. Tracking, though it's a long, hard process to set up because of its detailed character, is becoming a tool that goes well beyond the usual logistics functions. By monitoring the entire logistics chain, it becomes a valuable indicator of competitiveness and differentiation.

By tracking information, it's easy to understand and anticipate market behavior, for example the disturbances that affect a condition considered normal in a given system. Like the supersonic planes jam-packed with autopilot electronics, modern systems must remain airworthy no matter what the flight plan or disturbances they must undergo. To do this, they've been incorporated with sensors that render them retroactive, and enable them to return to a “normal” state when necessary. An abnormal reduction in inventory engages, subject to certain precautions – seasonality, for example –, the replenishment command. The increasing integration of industries and services, notably systems, facilitates the generic applications of these big functional entities. Then it's possible to model automations and autopilot systems, which are even more efficient and productive as they concern whole economic sectors.

2.2. Tracking: a tool for strategic differentiation

Specialized companies share the various functions involved in the delegated management of IT systems for large corporations. Since it couldn't depend on an integrated information system, this organization was neither satisfactory nor performing; each of the players in the chain wanted to preserve their independence. The consequences of not having a wholistic, integrating vision of all the movements of an IT system consist of a loss in business taxes, or an overestimation of amortized values when the materials are obsolete. The missing data means the equipment isn't managed properly. Companies observe abnormal maintenance costs because repairs are billed even though the computers are still under warranty. Sometimes, rather than continually repair a machine, it would be better to change it, or not repair it at all since anyway it will be replaced a few days later.

Idées Industries Services (2IS) – 26 million dollars in annual sales – settled into this niche in the early Nineties. This French company, which provides delegated management for third parties, handles the management of microcomputers, terminals and other office equipment for

big accounts like banks. This consists of handling the purchasing and receiving functions, customizing work stations, installing and maintaining the computers, providing tech support, and finally managing the inventory and investments in new equipment. The dispersal of the preparation, maintenance, monitoring and management functions, which had previously been shared out to several specialized vendors, didn't allow for an wholistic vision because the products and components weren't being closely tracked.

In the 2IS information technology system all the products or spare parts have codes. Its processes are so precise that it can anticipate demands for spare parts or propose preventive – as opposed to curative – maintenance operations. For the 236,000 articles in the Banque Nationale de Paris (BNP) computer fleet, the 12,000 movements the system performed in 1997 can be recreated and analyzed to detect sources of cost reduction, while recommending the corrective measures the BNP should take. 2IS made its tracking tool an instrument of its overall productivity strategy. This French company and its clients share productivity gains, and they are capable of reorienting their technology policy through the interpretation of the data collected throughout the lifespan of their computer equipment. 2IS integrated several professions into its company to gain the strategic advantage of a comprehensive service.

Companies will use this strategic advantage more and more for document and electronic commerce tracking applications. When cybernauts visit a website to research a term paper, or to get information about a product before buying it, or simply out of curiosity, they leave a trace of themselves, of their preferences. This mechanism makes it possible to identify the future consumer's profile. E-commerce businesses attempt to provide an extra added value by intelligently processing the data circulating on the Internet. For example, Amazon.com is known to offer personalized information on its web pages for its regular customers, like book recommendations and purchase histories.

In the future, very sophisticated intelligence agents, capable of learning, will search out particular data just about anywhere on servers. These tools will be used to plot data to automatically “profile” the people circulating in networks. The companies that master these mechanisms will gain a strategic advantage because they'll know everything about you. The meta networks will be one of the party because they they'll have an extra asset to attract and integrate other companies in a single knowledge network.

2.3. Meta networks track information to gain a competitive edge

The European project to link all existing public health databases to build a gigantic global database concerns not only a number of countries anxious to maximize the amount of investments granted for research, but also a lot of associations worried about possible abuses. Lying in ambush are the private companies who can't wait to capitalize on the project: like McKesson. The success of this American healthcare services company is based on its strategy of exploiting data collected from various players in the supply chain. Meta networks are already forming within the healthcare industry. In the United States they benefit from the aid of the private sector where tracking medicine consumption and local endemic diseases “profiles” the types of consumption useful to the health and pharmaceutical distribution segments.

When within the next decade one billion individuals and companies have become accomplished cybernauts, this sales and promotion system will become an absolute must. That means that building and processing files will become a strategic exercise for companies that are already investing enormous amounts of money it. Brylane, an apparel mail-order company, has a file of 21 million clients grouped into 75 categories of different types of buyers. It also has a file of 20 million prospects who have yet to buy anything, but who are solicited on a regular basis.

Meta networks or integrated professional communities set up their sensors on the Internet. Thanks to their interactive and direct relations with cyberconsumers, they develop tools that can provide the entire organization with the results of the data collected on the network. The stakes are high; companies move from tracking to exploiting data collected all over the place. The automatic analysis applications within the networks establish multidimensional relations between the customer and the company, among certain products and services, and soon among individuals. In 1999, the 2 billion dollar acquisition of Clarify, a small company specialized in customer relations analysis software, on behalf of the Canadian company Nortel, illustrates the importance of these applications for a network of added value services. These “customer service” applications will render the business affairs of meta networks “intelligent”.

The revolution of electronic commerce applications revealed the incredible possibilities of IT networks. They make it possible to automatically compose personalized offers through the identification of any John or Jane Doe using the network. Big hotels once had the reputation of knowing precisely what their clients wanted; they would often make special efforts to personalize rooms or services. The staff was trained to write down the smallest details about their clients in a customer registry. Consider for a moment that this type of registry is available to any member of a network of companies with which you have done business. Imagine also that this network has a continual promotional program in which each of the members participates. The chances are high that, as you perform any type of operation, like a bank transfer, a personal – and no doubt attractive – offer will appear on your screen. Or maybe you'll receive an email telling you that, because of your recent participation in an online auction – which fell through –, an exceptional promotion is being held for one day only, and you can get that vacation package for next to nothing (but just a little bit more expensive than the auction, of course).

3. The forecasting tools of intelligent networks

If you were to ask, “Why were economists invented?” at a convention, invariably a voice out of nowhere will respond, “To make meteorologists look good!” Today, irony of fate, the Smith Barney exchange in Chicago uses meteorologists to forecast and anticipate the effects of the weather on the price of corn, soy and wheat. The meteorologists advise the speculators and economists. Once very powerful computers have compiled and compared millions of parameters, millions of dollars will be invested in raw materials on the sole basis of advance signals that anticipate the development of agricultural, of energy demand, of tourism.

For its part, the CATCH program recently made it possible to identify human remains and link two apparently distinct elements to a single criminal case. CATCH is the new collaborator of the attorney general of Washington state. CATCH, which stands for Computer Aided Tracking and Characterization of Homicides, is a method for categorizing crime scenes and finding similarities to other crimes scenes. Equipped with artificial intelligence, CATCH uses the technique of neural networks to “catch” similarities among the thousands of homicide and assault cases stored in its memory.

Automatic data analysis programs are gradually making their way into companies. Better use of the data the company has already stored makes it possible to correlate events in order to better “profile” a customer and his or her behavior, for example. Usually customers with average to high incomes have more nonpayment episodes and debts than customers with low incomes, making them more open to revolving credit. Or sometimes the owners of a certain make of vehicle dine out more often than others, which makes them a target for travel agencies. Finally, the visitors of such and such a website manage their own finances and thus receive personalized letters about e-trading. In fact, there are an increasing number of agents that “profile” users, and offer new products or services in accordance with these data.

Intelligent network applications, still rather abstract for non-experts, aren't very well known. Sometimes an article appears in the press about the big brother issue. But in the majority of papers, you sort of get the sense that the authors are just trying to scare you, and that they don't really believe in the whole thing. They're neither right nor wrong. They're right; you never know how bad something can be. For that matter, network espionage exudes its own negative feedback. They're wrong, because the danger isn't coming from where they think it is. It won't come from countries, but from commercial networks. These commercial networks will know everything about you: they'll know your impulses, your needs, your family's needs, and your free time. Intelligent, informed, aware of everything that happens in a forum or database, without any human intervention they'll offer you services, and manipulate you.

We're witnessing the advent of companies that are very specialized in collecting and processing all kinds of data. They'll spy on the competition, or individuals, they'll monitor specialized forums, and they'll even send questionnaires to your home. Companies collect an increasing amount of information about their clients and prospects. They look for an argument to sell you something. The classic sales approach is very costly, and sales personnel turnover is high. Refining a company's target, by getting to know the individuals or companies that could be interested in its offers, can reduce these costs.

The global village that Mac Luhan imagined is a village full of nudists. Nothing left to hide? Cash registers have been recording our purchases for years, to the delight of specialized marketing analysis firms. But *in principle* we remain anonymous. There's no question about it: cameras and electronic gates track our every move, electronic exchanges and message systems archive our conversations and transactions. The majority of people will resign to it. Others will learn to more or less passively resist this tracking of their every move.

3.1. The increasing automation of marketing and commercial transactions

Tom Siebel, president of the American company that bears his name, seems to have hit the jackpot with his idea, seeing as his was named "fastest-growing company"[160] by Fortune magazine in 1999. Because modern commerce exceeds traditional distribution channels and develops into multichannel sales, Siebel provides tools that automate sales, marketing and customer service channels. It's hard to imagine that a simple click on an advertising banner can provide so much information about visitors. Specialized companies, like DoubleClick in the US, distribute some 5 billion advertising banners each week around the world. Through them it's possible to know what kind of computer and navigator visitors are using, their originating server, their PC's IP code, the URL of the pages visited, and even the products they've purchased from clients using their banners. By personalizing the cookies installed on the visitors' computers, companies can track cybernauts' movements on the web, and exploit the data for profit. Most companies choose computer-assisted direct marketing. According to the Direct Marketing Association of New York, this method accounts for 58% of total marketing expenditures (including traditional advertising). The companies that use it saw their annual sales increase an average 7.8% a year between 1991 and 1996, compared to 5.4% a year for traditional retail and interprofessional sales.

Intelligent networks will also serve to attract or retain cybercustomers. Salespeople learn that they have three minutes to attract and keep their customers' attention. The electronic sales agent has eight seconds. According to Zona Research, cybernauts either zap or disconnect after this fraction of time. One third of potential buyers discontinue electronic transactions in the middle due to a website's slowness, which accounts for a loss of potential earnings of some 3.6 billion dollars for US e-commerce sites[161]. Also, all the companies involved in electronic commerce seek solutions that reduce the costs of gaining, keeping and managing customer accounts. Their first priority is to build a customer database. According to a 1999 study conducted by IDC and Cap Gemini[162], one quarter of companies capitalize on their customer file as having a certain value or market power. The objective of the company that owns these data is to get the most out of this value.

From freebies to spam, specialized companies have very creative ways of targeting your soft spot. Firefly uses comments left on its website by visitors, who describe what they like and dislike about the site, to send out personalized offers. Smarter visitors start to figure out that the information they leave behind is valuable. As a result, there is a kind of negotiation going on, a more or less explicit barter. Hotmail is a perfect example of this progressive change in the relationship between companies and the market. Push automation techniques are used to propose samples of products or services to persons who agree to sign up on the preferential lists of a certain number of websites providing online information. These new organizations may have started with press agencies, which earn extra cash through them (by selling their

160 Growth of 218 % in 1999 revenues.

161 The average demand for speed in 1997 was 2 Mbps for 80 % of European companies. In the early 21st century, with the development of intranets and video, only 30% of this demand will be satisfied. Half of all European companies will require a minimum speed of 34 Mbps. In France, the CNET believes it possible to patch 50% of the population at a speed of 8 Mbps and 60 % at a speed of 4 Mbps. Only very specialized operators will be able to respond to the demand for very high speeds.

162 01 Informatique, July 16, 1999.

files plugged with advertisements), and which need them to develop very targeted online information. The advantage of the push model is that it goes through a little search program according to a thematic selection grid that automates the work of building a personalized information or press file. Needless to say, it then becomes very easy to make associations between the themes chosen and the advertisements that have the best chances of attracting the attention of push model readers[163].

The French company Matranet recently launched WebCenter, an original call center, to say the least: each surfer on a website that collaborates with WebCenter is followed around by a tracker. The latter knows exactly where the visitor is at all times. If the surfer is interested in a specific product or service, he or she clicks on an image that puts him or her in direct contact with a sales department. An interactive dialogue begins between the salesperson and the visitor of the virtual store via an instant messaging program. The future installation of web-based telephony services or, later, video-telephony will make things even easier. Intelligent network trackers will continuously trace the itineraries of website visitors. On a visit-by-visit basis this information doesn't mean much, but the law of numbers makes it possible to identify the most successful pages or the advertisements that attract the most people, and to interactively derive marketing intelligence from it.

New systems applications are appearing that propose certain services in exchange for personal or targeted information. This practice could someday look like brainwashing or computer-assisted forced sales. Don't laugh! It's very easy to harass someone, to create artificial emotions with a computer.

3.2. Lurkers on the Web: the development of tools for analyzing intelligent networks

Data analysis techniques facilitate the fight against fraud. The Financial Crimes Enforcement Network (FinCEN), an agency of the US Treasury Department, implements knowledge extraction techniques to target its investigations of money laundering and other financial crimes. A computer system exploits the 200,000 reports of transactions involving over 10,000 dollars, and analyzes any suspect links to possible crimes. Suspect reports are then the object of complementary investigations that can mobilize several federal agencies. In 1995, the system detected over 400 affairs that allegedly involved over one billion dollars in laundered funds. Travelers Insurance uses a similar system to compare health insurance claims, by detecting rejects according to a series of rules incorporated into its computer system. Financial institutions and telecom operators do the same with credit cards and cell phones[164].

These were the first examples of how computer applications can detect logic within a deluge of information. With meta search engines it's possible to read the competition's mind. Software programs designed on the basis of cognitive applications of artificial intelligence are capable of detecting signals that show why a company is conducting a given search or what new strategies they're preparing. Data tracking picks out the most fertile inventors, the most dynamic laboratories, the best places to hire talented engineers. Jamming patent depositories

163The IT systems “pushes” personalized information after someone responds to a questionnaire.

164According to Yankee Group, the market accounted for 19 billion dollars in the year 2000, or 30% of the global Internet market. If exact, this percentage is enormous because it reinforces the hypothesis of traffic jams on the Net, but also in corporate networks that won't hesitate to use the push model in their intranets.

doesn't work anymore; search engines can detect the number of times a data is cited in a given time span and give it an occurrence, a score that will launch more in-depth investigations. This analysis is even harder to jam when you consider the growing number of people involved in the innovation and design phases of a product. The fact that you can identify the transmitters and receivers involved in precise professional exchanges says a lot about the analytical capacities of sniffer programs.

Sniffers and other meta search engines are excellent tools for keeping companies on their toes. Monitoring competitors' websites or patent depositories, while building automatic files on a chosen theme, illustrates the importance of better exploiting existing knowledge, of shifting from a searcher approach to a finder approach.

There are tools that have a booster effect, and that facilitate the detection of new approaches, of emerging trends. To help companies get ahead of the game, new vendors are entering the market with personalized data monitoring and processing services based on very precise demands. MicroStrategy, an American decision support software editor, provides this type of comprehensive service, the results of which can be distributed to users via any type of support in real time (computer, cell phone, e-mail, pager).

The diversification of social groups and the shifts in trends and expectations in a global culture makes it increasingly difficult to analyze the markets. A trend or initiative can start in Japan or Australia before contaminating the rest of the Triad. The acceleration of purchase and consumption methods makes it necessary to further fine-tune the “radars” that detect signals from all horizons. Meta search engines are just some of the radars available on the Net to detect indications in the online press, in discussion forums, and in the creation of websites. Trend identification and monitoring tools are only a step away from intelligence service tools.

Little known, these tools will be used throughout organizations. E-business intelligence applications will soon be available to Internet companies. Electronic commerce already uses special search engine to identify suppliers and compare prices.

The development of e-business intelligence tools follows data mining and neural networks. According to Jeff Papows, president of Lotus, who recently announced the launch of Raven, modern computer tools must respond to a three-fold problem: bring the right information to the right people at the right place. To do this, Lotus recently conducted its own conceptual revolution by shifting from a computer infrastructure approach to a knowledge infrastructure approach. Millions of ideas, hypotheses, calculations, and results of think tanks developed by the most intelligent sources on the planet will become accessible and “recombinable” in accordance with the wishes of each person or company through the use of these knowledge extraction tools. They will offer even the smallest companies the possibility to further break down modern frontiers, the frontiers of knowledge.

This explosion of data also presents the problem of the growing need for automatic synthesis. Business Objects offers to widen its range of query, reporting, and online analytical processing tools in a “self-service” available on the Internet: WebIntelligence. Intelligence

agents inserted into searches verify whether the information is recent, distribute the load of data to process, verify the availability of bases (thus avoiding biases due to a lack of regional data). You can imagine the interest of these applications for a small business that, using a service like WebIntelligence, could provide its own clients with syntheses or specific reports resulting from the data processing this type of application performs.

Other intelligence agents, like the French Datops, are capable of drawing trends from modifications identified in indexing tables or in the most recent declarations made on the web. A particular score of the data processes shows the places – the servers – where the most interesting data are located. An excellent example of this is hypermedia mapping. Ismap is a company that designs maps of cities with populations of over 10,000. A zoom option enables visitors to find a specific address in a chosen city, then find the building that has an apartment for rent, to take a virtual tour of the neighborhood to see what kinds of services, shops or schools there are there. Intelligent document exploitation systems work in a similar fashion. Say you're working on an exposé about the desertification of southern Spain. During your prep work, your computer will automatically propose links and complementary information to help you write your exposé.

In the coming years, there will be a growing need to detect hidden logics and defects, or suspect phenomena, to identify and target specific groups of buyers. In 1996, Kraft Foods tried out knowledge extraction software designed by IBM to analyze the behavior of buyers using data collected at Kraft's sales points. This enabled the company to isolate groups of customers likely to be interested in specific sales offers[165]. The need to preserve our capacity to criticize the pertinence of established relationships will certainly result in the creation of new organizations that will ensure the quality certification of the data, their exploitation and their development into intelligible information. They will have to be independent and closely monitored by public authorities (regulated) and trustworthy third parties. This will be one of the solutions to control this big brother making its home in the meta networks.

3.3. Humans are the weak link in meta networks

With groupware networks and knowledge management tools, we thought the challenge was shifting from individual productivity to collective intelligence productivity. We were wrong. With intelligent networks the challenge is detecting hidden logics before everyone else. Meta networks equipped with artificial intelligence will be capable of doing without humans, just like a fully automated factory, to develop and operate. In the past, we developed factories that operated under limited human supervision. In the future, there will be networks that operate with no human intervention at all. We already have automatic telecom platforms with no human operators. Voice recognition sensors take your orders and follow your instructions. Banks operate without ever receiving a customer. Companies prospect via talking machines.

Billions of data circulate inside intranets, extranets and telecommunications around the world. It took more than ten years to exploit the data collected on the first voyages on the moon in the Eighties. Subject to the Santa Fe effect, the complexity of modern organizations leads to a growing demand for data production and exchanges. All these data saturate the individuals

165Le Monde Informatique, October 29, 1999.

charged with delegating their management and, especially, interpretation to computer systems. All these data are now inside computers distributed around the world. The knowledge and logistics needed to manufacture a product or provide a personalized service have become so diverse and specialized that each link in the chain is now of equal importance in a collective organization.

- First consequence: each link must stay abreast of the developments in its sector; just as it must keep its industry informed of any discoveries it makes. It must participate in collecting knowledge in its professional sector. So hundreds of gigantic servers reproduce data that is more or less useful and sometimes rapidly obsolete.
- Second consequence: the crucial factor is no longer how well the information circulates, it's knowing which link should be solicited or not, and when. Sharing out resources involves indexing available skills, knowledge and resources. At any moment, we have to know if a member of the network is available, and whether the resources we need can be mobilized, and how quickly. Navigating through the meta organizations that are meta networks is similar to navigating through the hypertext on the Internet. Only powerful search engines and knowledge interpretation software are capable of responding to this problem.
- Third consequence: in these entities, a systems disturbance can occur in the current of a series of events and cause a serious failure. Which automatic processes will you have anticipated? What kinds of backups should you set up? The only thing you can do to limit these risks is use automatic event-process analysis techniques.

The automatic controls set up in meta networks must respond to three criteria: be able to procure knowledge in real time, be able to identify the chain of players to mobilize practically in real time, be able to anticipate future events. Like the IMS project in manufacturing, resources all over the world must be rapidly mobilized, and be useable on demand thanks to the automatic controls that pilot the corresponding information complex. This means it will be necessary, as we had predicted in The Virtual Enterprise[166], to agree to abandon a certain amount of sovereignty when becoming a member of a meta network. Finally, the increasing automation of data storage and tracking, or searching for and interpreting data, is the only answer to the problem posed by the electronic deluge. This will involve granting increasing autonomy to intelligent networks, which will continue to do without humans as much as is possible.

4. The sale of “ready made” organizations

Everyone's talking about reusable components, off-the-shelf products, and “packages” of comprehensive services. Companies propose business plan models and indicators that are standardized and delivered configured for each specific case scenario. Start-up kits,

166 The Virtual Enterprise or New Ways of Working, (Paris, Odile Jacob, 1992). Multilingual versions available at www. ettighoffer.com

competitive methods and analyses, and various management modules are proposed every day to companies that are beginning to discover the comfort of using the thorough knowledge of software programs, rather than having to reorganize complex procedures. Organizational intelligence is being used all over in products and services to reduce the cost of accessing knowledge.

Led by the demand of large fragmented organizations and economic sectors, we are witnessing the emergence of a concept of "step-by-step"[167] building blocks that respond to the demand for competitive, comprehensive solutions. Step-by-step solutions are the product of the accumulation of experience and knowledge in sectors or functions that require no-fail efficiency in the management of complex, sometimes unpredictable, actions. This accounts for the predominance of applications based on knowledge, compared to those based on the management procedures that prevail when growing companies economically. These computer-based, "industrialized" solutions help structure the organizations that intend to use this new type of "Lego blocks" to facilitate the *plug and play* aspect of their respective functions in any economic sector.

4.1. Organizational intelligence is incorporated into software packages

When in 1998 we suggested to one of our clients, a bank, that instead of insisting on buying a traditional bank they should buy an online, virtual, off-the-shelf bank, they thought we were pretty crazy. We started researching the market, and contacted some of the big global service companies to study this idea closer. At first nobody understood what we were talking about, but very quickly our contacts in France and abroad started to tell us about some international teams that had built real online banks in the UK and Spain[168]. Over the years, solution providers have built up so much know-how that they are now able to propose increasingly specialized software packages. These packages were supposed to adapt to various situations; they include the possibility of configuring applications and increasing the number of reusable software components depending on how organizations are configured. The ultimate concept is being able to offer comprehensive systems solutions that include the organization of the service or services in question.

The Security First Network Bank (SFNB) took this plunge. Realizing that the stiff competition of traditional banks limited its expansion, this bank chose to focus on selling its virtual bank organization, Virtual Financial Manager (VFM), to other banks. SFNB, founded in 1995 as the first virtual bank on the Internet, has already sold its VFM system to more than fifty or so banks. Six already use it; fourteen are in the process of setting it up. By changing strategy, SFNB found the capital it needed to improve its VFM system and increase its distribution. As a result, SFNB is now a technical-organizational procedures consultant and recently acquired Solutions By Design to be better able to respond to its clients' demands.

167Perspectives des TIC, OECD, 1997, p. 196.

168See the Atlanta Internet Bank of the Security First Network Bank (SFNB) division in the United States.

All the big computer and telecommunications companies offer ideas about “How to build your own virtual shop”. They offer package solutions: a comprehensive service that includes everything from designing to managing an e-commerce website (payment, orders, invoicing, catalogue management), often outsourcing the remote management and administration of the site.

The development of integrated solutions will be one of the dynamic sectors in information technology over the next few years. According to Mark-Ess International, in France it accounted for some 13 billion francs in 1998, or double the amount of the preceding year. This is also a new positioning for total engineering, mobilizing pluridisciplinary teams and including the sale of materials, software, advice, configurations and installation support services. It's easy to see that an increasing number of service and consulting firms are setting up shop in this new niche where big contracts come quickly. The market will become rapidly very competitive.

But this role of total integrator, which involves messing around with the nitty-gritty of a client's organization, has its risks. As the sale of these “ready-made” organizations is becoming commonplace, serious errors in evaluating the implications of setting up these “off-the-shelf organizations” are cropping up. Sometimes a company has to abandon its overly ambitious reorganization projects based on ERP (*Entreprise Resources Planning*). The reason is that companies often underestimate the incompatibility between the flexibility (relational and organizational) required in the modern business world and the rigidity of ERPs. Obviously nobody thought enough about whether a company was going to be based on a virtual meta corporation approach or a meta network approach. Was the business model supposed to favor small entities gathered into collaborative, flexible clusters or bigger groups highly integrated into a very structured network? This duality seems obvious when the decision-makers willingly recognize that EPRs generate satisfactory results in homogeneous, well-defined and very specialized functional contexts. But this derails when it concerns large entities that have a hard time standardizing and automating procedures that limit human intervention. James Bruce, vice-president of MIT information systems, insists on the complexity of processes and especially on the importance of intervening on very elaborate systems: “If a thousand people have an authorization for this or that function and you want to change this configuration, you may have to spend an hour per case, not to mention changing the systems process.”[169] ERPs are not fully satisfactory because they only work when you make the machine organization predominate the human organizations.

4.2. ERP solutions industrialize information technology and organization

The main characteristic of ERPs is managing interdepartmental processes, like workflow did, with the goal of participating in management and decision support. These ERPs favor decompartmentalization among departments and can be applied to the entire company, that is to say fragmented among different locations. Finally, they're proposed to companies or affiliated partners to standardize computer exchanges as much as possible, for which they are often used in building a meta network. The development of business to business, characterized by EDI (electronic data interchange) type exchanges, favors these inter-organizational information systems to such an extent that they act powerfully on the value

169Miryam Wiliamson, “ Heurs et malheurs des projets SAP ”, Le Monde Informatique, November 21, 1998.

chain of the entity thus formed. The integration of companies into meta networks, whatever their respective size, brings up the question of the economies of scale made possible by their merging, and then of the coordination and coherence of the shared policies and information systems. The incompatibility between certain information systems can become a handicap for the new group. In the age of networks, this problem becomes a major factor, which accounts for the success of ERPs.

In a meta network, setting up a common ERP can facilitate a merger. In fact, it's an opportunity for the network to preserve its leadership in a virtual organization. This was a successful strategy for the American company Ingram Micro, a global wholesale provider of technology products and supply chain management services with annual sales of 16.5 billion dollars in 1997. According to its information manager, Dave Carlson, all the group's acquisitions are driven to revolve locally around an IT core that standardizes the entire global system. The backbone is structured around central applications called Impulses, perfected by Ingram Micro. The central sites gather the data from the global network plugged into local networks of microcomputers equipped with in-house applications and adapted to the specific requirements of each region by a mobile systems team[170]. In a global intranet, consolidating accounts, using data or making reports becomes a real headache. SAP type solutions, which are quite suited to global and multilingual support, are interesting because they force everybody to converge on a single model rather than attempt to reconcile the existing systems, with the risk of making everybody unhappy. The other advantage of this strategy is that it forces different nationalities to work together on a common project of merging common standards. Eclin, an American automobile parts manufacturer, replaced an embarrassing jumble of regional solutions with an EPR provided everywhere the company operates and configured by The Baan Co. to meet local standards.

In any case, the problem is agreeing on the working language, the communication standard and the systems environments. It's in the integrators' best interest to force companies to define procedure models, the representation of decision support tools and therefore the data aggregates that will build the results of these measures. That last point seems to be hardest to obtain because it involves the cultural behavior of each country in terms of accounting rules, risk analysis, and the specific interpretation of a given industrial or financial situation. That's why interventions should be outsourced to teams that support and often cushion tensions among antagonist management teams.

But EPRs are mostly industrial “ready made” organizational solutions. Orient Overseas Container Line Ltd. understood this. It used the SAP R/3 modules to formalize and model a comprehensive solution for all of its 144 office around the world. After having spent millions of dollars to set up a centralized financial system, the general manager, Paul Mok, must adopt a course to reorganize his accounting organization to adapt it to the modules the German company has proposed him. These modules will be implemented progressively. The interest

170Computer World, November 1998.

of the operation will lie in the acceleration of the accounting procedures the group has been reorganizing over the last six years, which will enable the company to reduce the accounting staff at its Hong Kong headquarters by one third[171]. Nevertheless, Paul Mok will shrink from the idea of developing EPR or SAP applications. Too expensive and too risky, we might add, because selling “ready made” has its negative sides, too.

4.3. The integrators are wishing they had agreed to sell organizational models

The development of the big EPRs constitutes an imposing software building block that integrates all the functions and interfaces of an organization, including the external organizations of clients or vendors. Maybe this has all gone too far. For the integrators, the myth of non-structuring IT systems has been shattered: it's not the software that adapts to the company, it's the company that adapts to the software. Even if integrated software is configurable, they squeeze the organization's functions into a ready-made model. If a link is defective the system jams, or the problem affects the entire chain in no time at all.

Furthermore, integrated software generally covers all the functions of a company. The installation and support costs have become considerable, and overbudgeting is discreetly conjured away. According to Jim Johnson, president of Standish Group, 90% of EPR type projects are not completed within the time prescribed[172]. Reorganizing procedures from top to bottom, and introducing real time, means employees have to drastically change their ways of working together. They make an even bigger fuss about adapting, as they fear future downsizing operations.

SAP, a Germany company that employs 70,000 people, claims to be a software editor. With annual growth of 70% and working in 50 languages, in just twenty years it has become a world leader in integrated software. “We sell CD-ROMs,” insists one of its representatives[173]. Rather than set up its solutions itself, which would have forced the company to invest in significant support costs, the editor preferred to conduct a partnership policy with consulting firms. Of course, some still haven't mastered the engineering skills needed to install such complex and ambitious software solutions. Just because a company gains on the purchase of a ready-to-use IT solution doesn't always mean it will be able to control the costs of the organizational changes that result from its installation. Even more so since headquarters often unloads problems relating to what was supposed to be a general and strategic reorganization project on their IT departments. Result: considerable losses of time and money.

SAP and other integrators must cope with cumulative processes because they didn't know how or couldn't handle the consequences of the extreme complexity of setting up an organization. Fox Meyer Corp., a Texan pharmaceuticals distributor, had to file bankruptcy because of the failure of its IT system due to problems with the German company's integrated management system. The company, at whose Ohio distribution center were transiting 1.5 billion dollars in orders, could no longer operate properly. It's looking to recoup 500 million dollars from Andersen Consulting, charged with implementing the software. “The garbage men toss out SAP”, read the title of the July 2, 1999 edition of *Le Monde Informatique,*

171Computer World, May 1998.

172Le Monde Informatique, November 21, 1997 (but it's true of the majority of projects).

173J. Halperin, assistant general manager of SAP France, speaking of CD-Rom software.

commenting on the rejection of the SAP software on behalf of two large American companies specialized in waste disposal. By acquiring its competitor Browning-Ferris Industries, the Texan company Allied Waste Industries decided not to pursue the implementation of an SAP system considered too complicated and expensive (it would have cost 130 million dollars). The president of Allied Waste Thomas Van Weelden commented on his decision with this statement: “SAP expects you to organize your company according to how R/3 works and not the other way around.” Everybody's happy about the money and worries they'll be saving themselves.

The integrators will long suffer the consequences of the misunderstanding that IT systems should adapt to the existing organization. Everyone knows you can't install an IT system without affecting the organization. Today companies sell ready-made organizations. The relative failures of implementing integrators are almost always a result of this misunderstanding. Even with the mobilization of personnel and executives, EPRs still run the risk of becoming money pits because they require a lot of structure and planning. Though they favor the industrialization and information structuring of companies organized in intranet-type networks, they clash with the need for simple, robust, flexible solutions that can facilitate adaptive behavior while consuming the least amount of energy possible.

4.4. Off-the-shelf applications: corporation kits are standardized as "plug and play"

Companies with fewer than 500 employees rarely use EPRs. SAP targets companies with annual sales of at least 250 million dollars[174]. Also, to get around problems caused by the rigidity of overly comprehensive solutions, and the need to make these solutions available to clients that aren't big multinationals, it proposes “step-by-step” component-based software packages with a more limited impact to small-medium businesses.

These “ step-by-step” platforms, which automate all sorts of administrative procedures, are weak service components that can be configured and that come with very specialized function-by-function after-sales services. The sale of organizations like this, with comprehensive engineering of the IT solution and installation support, is becoming commonplace. Nevertheless, the clients' organizations and procedures still have to be reviewed. These platforms now cover a wide range of common functions like marketing, public relations, payroll, call centers, after-sales service, and sales management. The development of comprehensive integrators has been followed by that of integrated management software dedicated to the key functions of very specialized companies.

The Swedish software company IFS Application proposes component-based step-by-step integrated management systems configurable and sold to clients according to their needs. Its integrated e-commerce application, ISF Business Performance contains all the modules needed to automate sales and manage inventory, players (vendors) and clients (relational database), all of which converges on a trend and decision support chart. Realizing that small businesses still didn't have the skills needed to set up and administer an intranet, Lotus allied with Azlan (wholesaler), Cisco (network equipment manufacturer), France Télécom Oléane

174For its part, SAP will bank on EPRs by proposing its industry solutions.

(access provider) and a few other companies to propose a “ready-to-use” intranet solution. “Solution management” includes a message and cooperative work server, the Smartsuite office applications with the Via Voice software program for voice recognition, Internet access and technical support. This “package”, payable in several monthly installments according to need, illustrates the general trend of the changes in progress.

These are “organic”[175] components that are generally based on languages or relational databases known to IT teams as Oracle or Domino: “We deliver pieces of projects that are assembled later in the client's offices”, comments Eric Grison, who manages the installation of integrated management software for Andersen Consulting, France. Then the products delivered to the client have to be configured. The practice of recycling organic components is growing both officially and unofficially. Components used at Crédit Agricole or Crédit Lyonnais are recycled and adapted to other banks. When we were studying the idea of buying an online “off-the-shelf” bank, after a couple of months we had bought almost all the best creations of the sector for extremely competitive prices. All we needed were the experts to make it all work. This is becoming a common approach. It limits functional analyses and endless projects while making it possible to benefit from the tremendous amount of intelligence incorporated into “off-the-shelf”.

Software editors propose kits to small companies, less structuring organizational components. Small businesses can buy or rent competitive, comprehensive “step-by-step” systems to gain competitiveness. These companies don't have the size, means or skills to use EPR solutions. They're more interested in buying off-the-shelf services and plug & play type accounting services in big “cooperative business” networks, thus accessing specialized engineering and professional communities. Industrial standardization through step-by-step kits limits licensing and updating costs, and undoubtedly – if you consider the interest the big EPR providers have in this niche – paves the way to more ambitious systems integrations.

The fact that EPRs can be used, maintained and configured by laymen is the key to their widespread application in small businesses, which often don't have internal systems departments. Which is why there is often the temptation to supply EPRs and other applications via external facilities services providers. Renting complex ASP (*Applications Service Provider*) type applications online is supposedly less expensive.

The companies that rent EPR solutions offer systems components for “applied organizations” to small-medium businesses in a multitude of economic sectors. The solutions include applications, configurations, updates, training and servers. This type of strategy is meant to increase the number of EPR users by changing the marketing formula.

175 We're speaking of “organic components” because they aren't strictly machine applications but software packages supplied with their general and functional organization, their management rules and their procedures, which can all be configured. Of course, the project specifications have to be adapted accordingly.

Small and medium industries and companies buy “pre-formatted” functions, comprehensive software packages that can be cut down into little profitable units and integrated into virtual organizations. That's why providers of EPR-type components, less involved in terms of overall organization, are focusing on these types of companies. The only thing that remained for the integrators to do was build a shared services platform to change the base of their business model, which SAP recently did when it announced it was launching its online self-service mySap.com.

It's clear that organizations in sectors that are standardizing their exchanges are more interested than others in EPRs. Editors are also pushing for vertical integrations that facilitate the sale of industrial solutions and reinforce meta networks.

4.5. Meta corporation or meta network? The "which comes first?" dilemma

But users will still be afraid of EPRs as soon as they see the impact they have on their organizations. In compensation for a standard offer that manages the entire organization, and will no doubt cause trouble with the connections to in-house applications or elsewhere, implementation is pared down to the bare minimum, just like rollout.

Despite efforts to improve the quality of the interfacing, except if you choose a meta-network organization, EPRs don't respond to this major criterion of virtual organizations and global corporations of being able to freely increase the number of teletransactions among multiple organizations. The power of cooperation has been exchanged for the power of integration, and constraints in exchange for the flexibility of combining forces.

The question remains whether the vertical integration of meta networks won't risk keeping small innovative businesses from developing by limiting membership through software standardization. A high concentration of players along the meta network backbone will not necessarily be the result of competitive strategies, but the result of the formation of a league of companies that will constitute a potential monopoly. This is even more plausible if these leagues lose the flexibility of alternative solutions, as in mass marketing. However, they do benefit from operational hyperproductivity.

The big danger is that these companies become dependant of their “step-by-step” solution providers. Firstly, this type of business model distorts the traditional model of interdependence since the provider is not directly integrated in its clients' value chain, contrary to meta corporation or meta network organizations. The weakness of this technical-organizational model lies in the fact that there is no community of interest in this type of organization. Furthermore, EPR editors risk finding themselves in delicate situations because they have continue investing in all the sectors of vertical activities they started to market over the last few years, which is very costly. Getting to the heart of a client's activity is a risky, long-term challenge.

In conclusion, it remains to be seen how much freedom a client will have to back out of its commitments, and the power the renter will have in its client's organization and IT policy. Not to mention what could happen if one of the parties is subject to financial hardship or has

technical problems. There is the risk that the supplier of raw computer power and “step-by-step” components will cut its clients off from its IT system. A very annoying problem that, as in inheritance cases, only seems important after the client dies. Yet the answer is obvious: you just have to back to the beginning of this chapter and imagine you're in the shoes of our chicken farmer!

V. THE CREATION & MANAGEMENT OF VIRTUAL ORGANIZATIONS

"… Fortune is the arbiter of one-half of our actions,
but she still leaves us to direct the other half…"

MACHIAVELLI, The Prince, (1514)

Contrary to what many people believe, intensive technological activity has not significantly reduced or created jobs. Historically, dominant organizational models were the main reason for growth or cuts in a company's workforce. Today's work activities are organized differently, thanks to NICTs, that share resources, skills and people. They have fundamentally changed the cost of transactions and the ways that companies cooperate, hence a generalization of subsidiarity: virtualization is used to take the best at the cheapest rate wherever it may be found.

The practical repercussions on organizational methods, as they are influenced by computer networks used to restructure the global economy, remain under-estimated. Our society and our companies are going through a period of big upheaval. Organizational competitiveness has become widespread: it concerns nations as much as it does companies. The difference will come from man's ability to use information and communication technology to innovate new forms of organization. A double movement of adaptation is forming: one comes from pure performance growth through the hyper-productivity of meta networks, and the other from the development of clever new ways of combining organizational models with meta corporations.

Meta corporations or meta networks develop structures in areas of activity that give them an advantage according to whether or not they are exposed to price competition. We usually see both methods used simultaneously, trying to make up for the flaws or the disadvantages of the other, while attempting to stand out and be different for their investors and customers. The structural innovations produced by companies in the 21st century are drastically changing traditional models. This means numerous adaptations of development strategy: new terms that will be the key to their success.

First of all, the trick is to keep the organizational shortage from touching the economy. In most cases, an increase in efficiency or in global productivity comes from the organization's quality as much as it does from one or more individuals. Today's organizations give too much importance to technological development and not enough to the repercussions they might have on the organization itself, which, in the context of international subsidiaries, can be a reason for the loss of chance for companies. Tomorrow, the major factor for a company's development will be the ability to be organized for *plug and play* activities in order to

combine with others easily. “Inforganizational” components will increase in number during the coming decades, allowing companies to interconnect rapidly according to specific needs. The modern manager has to be a master of combination for organizations, areas of specialization, able to coordinate participation and exchange between partners in large and small groups, all in the best economic conditions possible.

Secondly, there is new logic in management logic encourages resourcefulness, the ability to take advantage of all opportunities that come along rather than strategically planning everything out. Manual company piloting tasks are reduced in order to let today’s manager concentrate on assignments that have become more important than the everyday running of the company. We will see how federated management drastically changes the behavior of virtual relationship-oriented businesses. Federated management is a good answer to problems that come up in fragmented companies, especially meta organizations and virtual companies, characterized by a constant evolution of direction perimeters.

As a relationship-oriented organization, a company should be able to hear and understand useful signals in order to improve the way it responds to its market’s expectations. A company shouldn’t just virtualize its organization, but master its logistics in order to stay competitive.

Thirdly, in the future there will be no ideal model, only adapted models. A growing number of economic players will try to find their place and the model best adapted to their market by acting on sometimes surprising differentiating factors. Competitiveness in the future will be characterized by ferocious rivalry between different invented models because they are becoming assets for strategic differentiation to win over shareholders, customers and markets. Structural changes in businesses lead to capital gains on the stock market. We have seen how mergers and splits in big companies gain value, now we see that the invention of new economic organizations has become a source of wealth creation.

New ways for strategic cooperation organize themselves in network infrastructures that are becoming keys to power as they form big economic groups. Partnerships reinforce the development of branches where managers try to control and strengthen their influence over their partners. That’s why we talk about *virtual business models* VBM as opposed to *reengineering* that supposes the internal reinvention of a company with the help of NICTs. The VBM is an invitation to rethink the overall organization of the chain of players, including partners, customers, markets…It’s engineering that not only acts on in-house resources but on all external factors as well.

On the whole, the schumpeterien process of destruction/creation stays the same, but it’s accelerated for new reasons. Organizations or *virtual business models*, like knowledge, rapidly become obsolete. Intense selection due to the first steps in an intangible economy and the end of the “boundary effect” have devastating consequences on traditional companies. That means that companies have to constantly question themselves, to be able to imagine their future in order to be better prepared for it, and to use network alliances to impose their model. We will see that the VBM, the economic model of the meta organization, involves players that contribute to the running of the business, it’s success …and its direction. We will conclude with the predictable consequences that these new and fundamental changes have on

companies' structures. In fact, they force modern managers to modify some of their reflexes, their management logic and to take special precautions in order to be prepared for *crash management*, in case of the "cyberaccident" that threatens systemic companies, by reducing as much as possible the risks that are inherent to their growing dependency on computer networks.

1. A simplified vision of the organizations of the future

In an article about evolution of life[176], Stephen Jay Gould reminds us that humans have a hard time understanding that they aren't an accident of evolution. The notion of human superiority over nature was shaken when Copernicus took the Earth out of the center of the Universe, Darwin put us on a level with animals, Desmond Morris called us a social animal in The Naked Ape[177] and Freud did away with the myth of total rational thinking. In the same way, as big operational systems change and go through transformations, humans are no longer in the center of operations. In some organizations, especially meta networks, the 21st century worker will be assigned to supply or answer the system's needs to keep it running. Systems replace humans. Modern systems are customer- oriented, with just-in-time methods. They are organized to quickly respond to the customers' needs. It's to the point where in most cases, systems can work without any human intervention. Robots and computer systems beat humans hands down. But in compensation, the growing use of automatic systems frees humans from management and common operations leaving them more latitude to use their specific talents.

Like any system whose inherent logic is to adapt itself to different situations, companies evolve and organize themselves in order to meet specific operational needs in its branch of industry. From this point of view, automatic operations, those man-made cybernetic artifacts, are becoming more robust, capable of auto-piloting and of auto-adaptation in order to limit the damage that insufficient modern managers could cause. This is a normal, logical process. What isn't normal and logical is that in the midst of society's technological crisis, people believe that the logic of these machines will keep them from "insanity". Machines can automate many cognitive-help procedures but they can't process or anticipate a "combination of circumstances". We've said that chance, or luck, is part of the way business works, and the sense of taking a chance or grasping an opportunity is a question of feeling. A machine can't be programmed to want to collaborate or to do business.

In his book, Métamorphoses de la valeur [178], Georges-Hubert de Radkowski reminds us that it's futile to think of value only in terms of economic science and to only be a math genius to succeed[179]. For him, "the true base of economy isn't the lone exchange of goods and wealth,

176Pour la Science, "Le Hasard", April 1996.

177Paris, LGF, 1970.

178PUG, 1987.

179Remember the bad experience of the speculation business LTCM that was directed by the mathematicians Myron Scholes and Robert Merton, costing several hundred billion dollars to the banking system.

but the individuals that make the exchanges". He denounces scientific economies who, like computing, become skeptical when they claim to rationalize the irrational. Here is the traditional conflict between hard and soft sciences: knowledge that is dominated by the law of numbers or the one dominated by perceptions, life meanings; the choice between a society of numbers or…a society of desire!

Because it is a society of desire that creates wealth in companies, using new business models, outsmarting traditional ways of analysis and putting the stock market under pressure to choose as it hesitates between suspicion and seduction. It's a new phenomenon, symbolic of the new model: they are more and more unstable and Wall Street doesn't know to which speculative saint it should pray.

More than ever we're heading for a world of probability and speculation where, to paraphrase Machiavelli in The Prince[180], "Fortune is the arbiter for one-half of our actions," and computers can direct the rest.

1.1. The evolution of wealth creation models

Adam Smith's business models are still up-to-date. Market economy is still the mechanism that regulates social order. However, during the last few years, secondary factors have taken on new importance due to the development of telecommunication and computer networks. Economy is organizing itself into international industries that invent new "wealth creation motors". Formerly, a company looked like a closed box in which alchemists created wealth. Now a company is an association of industries, with operations organized in networks that make up meta organizations, all becoming new instruments in wealth creation.

Virtual companies without boundaries. If the cybereconomy hasn't fundamentally changed the ways of creating wealth, the links in the value chain hook up where the relationship of cost/global economic performance is best. Companies rebuild and reinvent a new value chain, a virtual business model (VBM) that takes into account the exogenous growth of operations that follow the whims and the needs of ephemeral markets. That's why there's an ongoing need for meta organizations to combine main activities, inventing new products or services.

It's absolutely unbelievable how the use of electronic networks enlarges the capacity for coordination and negotiation. Today, productivity comes from the ability to decompartmentalize and collaborate with others. It infiltrates the company's macroeconomy that's totally virtualized thanks to networks. Information economy is a systemic economy. Virtual organizations are combinatorial which allows easier innovation in complementary products and services. In a highly interdependent, coopetitive[181] economy, it's the only way to limit energy expense and to optimize the use of substantial cumulated resources of tangible and intangible capital, quickly becoming obsolete. For the same reasons, we see an increase in the number of products and global services supplied by several companies.

180Paris, LGF, 1972.

181The contraction of cooperation and competition. Companies are collaborative in some areas and competitive in others.

The renewed growth in advanced economies now comes from an increase in productivity due to the general reduction in transactional costs and in coordination. The productivity that affects financially important areas (commercial productivity, reduction of intangible capital costs, better use of available resources, limitation of investments for portfolio activities…) curbs, at least for a while, the risk of price inflation and allows for wealth creation.

After having invested time and money in the reduction of production costs, the cost of coordination and transactions between a sometimes large number of participants still needs to be reduced. Any organization that decreases the cost of transactions or coordination is like a superconductive cable that, having no resistance, loses no energy when electricity is carried through the cable. This is a good illustration of today's tendency. By modifying organizational structures, resistance is reduced (time loss, psychological and relational brakes, technical and human problems...) in everyday operations.

This problem is a known cause for company downsizing. As economic players develop their interdependency, companies usually choose to downsize as soon as the cost for outside transactions is less than the in-house ones. In most cases, arbitration favors the cost-reducing organization. The notion of subsidiarity, that we've already mentioned several times, will play a role here, either in favor of a partner or in favor of an in-house participant. The objective here is to improve the efficiency of transactions through better delegation. The significance of information technology and collaborative software is that it allows substantial savings on coordination costs.

Basically, both models for wealth creation stay the same: whether it be the use of networks, usually for the benefit of the strongest, to increase productivity gains as much as possible; or the use of networks to look for and offer new systemic services to the market, incorporating packaged advantages for customers, all more ingenious than the others. One model searches for absolute benefits, and the other searches for comparative benefits: they bring about two big transformations. First, they augment price competitiveness, a major part of the rivalry. Then, since there's a reduction in product differentiation, companies have to make it a priority to improve the quality of their products and services. This creates a new relationship with their customers; a digital relationship that reduces transaction costs in the final price. In the same way that the Internet helped reduce internal coordination costs, new *virtual business models* use extranets or the Internet to increase contacts while decreasing transaction costs with customers. At the end of a company's value chain, wealth models are like kings of the cyberconsumption but they're also at the center of conflicting interests among the many participants. The fight will be hard and there will be hitting below the belt. Virtual society will be cruel.

1.2. Executives hesitate between hard and soft organizations

Virtual organizations are either dominantly meta network models or meta corporation models, the first type are hard organizations that build on interdependency and the second is collaborative and combinatorial. Each model has its own logic for wealth creation. Meta networks try to hold a straight course, no matter what, and automate as much as possible, even if it means getting rid of humans; on the contrary, meta companies turn to humans for their creative and relational energy. The executive has to choose the *virtual business model* strategy that's right for his business. How can we combine the rational of structure, that in

exchange for hyper-productivity limits the freedom of movement, with an organization that is quick to move, having combinatorial capacities that favor conjugated wealth creation? The meta network VBM confines itself to an integrating approach to organization based on a computer system that is more or less structural for the company. The meta corporation VBM prefers the federated approach in which several organizations make up a professional network linked by common interests, working together more or less cooperatively. The first model counts on overall productivity through decompartmentalization and strong covalence between the concerned parties. The second opts for subsidiarity, using the most gifted in the value chain.

Both industrial models, or clusters, are necessary and illustrate, in their own way, future meta organizations that will compete in the 21st century. They will also be responsible for the origin of new monopolies. Cartels or oligopolies will strengthen and take on different forms than those of the fifties. Big groups will come together, becoming the reality of what executives foresee: the consolidation of competition with the disappearance of less important players.

Twenty years after the US deregulation in 1978, five American airline companies control air traffic and some have up to 80% of all scheduled flights. US authorities are attentive to these changes in the balance of power. In 1999, when Exxon and Mobil merged, the capitalization was valued at 275 billion dollars. In compliance with the US authorities, they committed themselves to drop 15% of their American market, which meant hundreds of service stations. The Commission for European Communities is starting to worry about the merger phenomenon that gives first position to entire industrial networks. Again, in the area of transportation, the Commission recently forbids the union of Airtours and First Choice who would have only held 34% of the English market, whereas Thomson and Thomas Cook respectively hold 30% and 20% of the market. For the first time in the history of company mergers, the Commission asserted that the setting up of several oligopolies in competition with independent companies would upset harmony and create the risk of smothering all independent initiatives. The Commission plans to limit merging in all business areas. This legal innovation should make merger fans think twice about vertical meta networks.

In a different way, instead of merging, travel agencies can choose to remain independent and still use specialized reservation networks like Amadeus, Sabre or Galileo that supply platforms of common service networks. The Frenchman Roland Coutas developed a meta company strategy through partnerships. Roco Production SA, his travel agency, has about ten in-house collaborators and as many outsourcers. It's become an international agency thanks to a partnership with the reservation network GDX Galileo. It allows him to post about 600 airline companies and a choice of 31,000 hotels on his website Travelprice.com. He innovated on the European market what was already commonplace in the US. Florida allows anyone to become a travel agent if they send in yearly dues of $250 to $500 to Global Travel International. GTI's turnover in 1999 was 120 million dollars for 26,000 members, that puts this myriad of micro-agencies among the top fifty largest travel agencies in the US. According to the New York Times[182] GTI's agents mostly organize trips for their families, friends and relations, dealing with big names. The savings and commissions that the agents earn using the network more than pay for the annual dues. The question is whether Europe, like Florida, will create favorable conditions for small economic structures to exist.

182Edwin McDowell, The New York Times , November 10, 1999, reprinted in Courrier International, n°471.

There are many areas to cover. After all, why would a group of corporations (or meta corporations) abstain from making profits on productivity among themselves? Swatch succeeded in improving its industrial productivity with a meta network model that worked with just-in-time methods, accelerating the rate of product rotation on one hand, and increasing agreements for new product creation on the other. But Swatch was in a leading position in both areas. The structure of ABB (Asea Brown Boveri), often cited as an example of virtual business, can't accommodate a meta network structure because it needs to keep its malleability that encourages collaborative combinations of all kinds. That explains why ABB has one of the largest intranets in the world, contributing to the development of cooperation and collaboration among its different participants.

In the long run, company and regional community development will depend on company clusters and networks of branch activities. Policies for systems management will be taken further in the coming years, forcing a cohabitation between hard sciences-and living sciences that accept the uncertainties and opportunities that life brings. Humans will be left with the desire to want to change things, the right to a "happy ending". You don't often see this point of view in management books. Although, it's true that that was back in the 20th century…

1.3. Automated processes change the role of management

Computer processing brought about major progress in the areas of increased automation and decreased uncertainty. In an unstable environment where companies are becoming more and more interdependent, automated management processes answer the needs of scattered companies. In the case of complex organizational networks, computers take over automated processes in order to limit any damage that might come from human errors or weaknesses. Systemic operations using computers can automatically identify task and time-sharing for white and blue collar workers. The system automatically reports and dynamically dispatches, without human intervention, processing times and necessary resources for the running of the company. The IES (Information Executive System) helps with processing and important data analysis that is necessary for managing the company.

Let's not make the same mistakes that we did in the seventies, when companies went overboard for computers. Or the ones from the eighties when artificial intelligence was supposed to be the absolute model for all systems. The same systems would be disrupted by people and situations and then questioned anyway. Reliable use is impossible if databases aren't updated. Such a simple thing to do, but so often overlooked. Moreover, computer assisted decision-making doesn't take into account underlying precursory phenomena. Computers rely on known factors. People use intuition about what's going on around them and often come to different conclusions than those made by machines.

In the same way, we can't just rely on the supposed power of a centralized computer system. Companies, especially virtual companies, defy central direction because their procedures are continuously changing and becoming more complex as more and more partnerships are formed (suppliers, personnel, customers, finances). However, it's also impossible to rely on local organization without strong coordination and retrospective skills. The central direction of a virtual or network company seems a little out of touch with the reality of the situation.

Evolution of the species tends to demonstrate that systems divide and specialize according to their local niche (making them more dependent on a global system, in this case networks). They tend towards simplicity with different ways of dividing up intelligence, reinforcing their capacity to coordinate and self-organize. Where artificial intelligence is concerned, it's more efficient to interconnect between a large number of simple programs than it is to use a central program, no matter how powerful it might be. In fact, the human brain works that way, with lobes, or specialized zones, that are closely interconnected.

Actually, when applied to organization and integrated virtual organizations in particular, it boils down to the transfer of central intelligence to the chain links. We no longer have an inverted pyramid as a model of hierarchy, but project direction, for each goal, entrusted to the most competent link in the chain. Each link is able to self-direct and adapt, working as a help-mate in the professional community.

Scientists are interested in this kind of organization because they see it as a way of collectively solving problems. Each individual has only a part of the information that is strictly his own, and he can't solve the problem alone; the "colony", or community can solve it together, and this, without the intervention of a central brain. Strangely, these are the same arguments that the economist Adam Smith used in 1776 when he said that each individual (each team), while trying to solve his own problem, was really working for the benefit of the entire community. His analysis of the situation set the basis for the first observations of self-organization in companies, that were studied by many specialists like Jacques Lesourne, in France. As meta organizations develop, local intelligence will be put to use in better ways, especially in federated management that can mobilize on demand the necessary skills for problem-solving or for leading a project.

Over the years, the increase in shorter coordination paths, made possible by communication technologies, has flattened the hierarchy between organizations. It's understood that the growing use of intermediation between machines stems from the coordination task-dropping that people used to accomplish. But that doesn't mean that there will be no more hierarchy; it will be relieved of administrative tasks in order to concentrate on the efficiency of collaborative work of available resource-sharing. When some of the administrative tasks and routine management is automated and left to meta networks to handle, individuals are freer to develop relationships and inventiveness in their work. The role of manager, or director evolves, giving more importance to his vision of the future, his role as a communicator or as a leader for people. The efficiency of the directing executive and also of the entire organization, will have positive repercussions on the quality of relationships as well as on the fine points of management control. Generalists who are capable of quickly mobilizing and leading their teams will be the most appreciated. This is new, promising material that can open new horizons for modern management.

Company executives who understand the basis for neteconomy increase transactions in order to build business partnerships; they adapt their organizations in consequence. The selection of the species on a hyper-competitive global market will benefit companies who know how to adapt and renew their organization following the clairvoyant directions of some individuals. The difference between the stagecoach manufacturer who survived by offering his services to the future railroad and the whip maker who died clutching his trade, is the clairvoyance of a

driver who steered into the curve at the right time. The curve of inflexion, as Andy Grove would say. The president of Intel and the "happy father" of a book, describes it as a curve that "only paranoiacs survive"[183] and it has to be taken at just the right time. A good driver is without a doubt a paranoiac. He's always imagining accidents coming out of nowhere, in fact, he watches the other drivers at least as much as his own car and the road.

Others prefer to rely on controls and they spend their time automating the pilot systems and ignoring the daily opportunities that are out on the market. They don't foresee the unexpected; these are the future accidents of the selection of the species.

The modern manager can't make it unless he breaks away from traditional methods and theoretical tools that go along with them: central control. When it's necessary to stop the automatic pilot, he will have to refine heterodox models of construction and delegate more and more of the construction to partners for help. The first characteristic of these models is to encourage opportunity while relying on a network of federated in-house and outsource partners, in order to have reactivity and flexibility that are in tune with the market. The second characteristic is to, above all, favor organizational simplicity, in order to encourage reactivity and autonomy in the field of work. The third is to increase the number of sensors collecting weak signals, "undertones" of coming change.

2. In search of competitive virtual business models

Traditionally, the auditing of an organization was intended to optimize its in-house operations. In the case of *reengineering*, it meant making the system horizontal with intensive use of NICT applications. *Reengineering* overhauls the allotment for consumed resources into one or several processes and deletes any problems that are detected by totally renovating the process, hence the common expression *process reengineering*. The process quickly ran out of steam because wealth creation, need we repeat, doesn't come from in-house production profits only. It also comes from original ways of imagining new business models that integrate several players.

Inventions that relate to business models are more often the fruit of the clever association of already known methods. These associations are possible with electronic networks that favor the solvency of new services and encourage the use of the law of growing returns. Cost reductions for access, negotiation or cooperation are brought down to under a dollar, and modify the economic portfolio with a multitude of models, impossible in any other way. Via the MP3 standard, music is broadcast everywhere on the Internet and damages the organizational model for the record and cassette industry. Books on demand, compiled from various sources, become possible thanks to *push information*. Telework and telebusiness is cheap and an Indonesian can offer his on-line services to an American company.

We create wealth using a clever organizational method that brings together several companies. The *virtual business model* invents a combination of ways that is becoming a new business model and a strategic arm. In order to develop a customer pool, free Internet access is offered; advertising, and press subscriptions pay for most of the cost, or the traffic alone pays for it. Others choose to offer Internet access for a special occasion that will encourage

183 Le Guide Pratique du Management au Quotidien, Paris, InterEditions, 1988

the use of derived services. The soccer club, Arsenal, plans on launching its site for derived products and services that will increase the financial success of the richest club in the world. *Virtual business models* follow one another, trying to meet the approval of their customers. The first one announces free Internet. It makes arrangements with operators who are trying to increase traffic on their server by offering consumer services that pay for part of the connection time; a little like Azur or Indigo for France telecommunications who pay back a part of their turnover from telephone services. The second offers a "free" home computer for a monthly subscription, counting on the sales of on-line advertising space to pay for access to a captive pool of customers for at least three years. The third stops at nothing; he pays the internaut to click on banners, thus earning points to save money[184]. Soon we'll see offers for free traffic. The cards are constantly being shuffled and the players, associated businesses, are now trying to cut with different *virtual business models.*

The invention of a new organization doesn't guarantee success. A company has to be daring to take the first step towards the use of new models in the face of an uncertain and structurally changing economy. Levis Strauss stopped selling on the Net, changing its strategy for its benefit, and reinforced its presence through other channels of electronic business like the big catalog sales company, JC Penney. Sometimes a company in itself provokes a rival business model. Compaq, then Apple launched their on-line after sales service for home computers in reaction to the brazen success of Dell…which immediately produced a reaction from some outlets. Like the Mac Parter company for Apple, who allied with other traditional distributors in order to open a site to improve their sales and customer relations.

Cybereconomy invites companies to change the rules of the game to win some points over the competition, to stand out from their rivals, to create a distinctive advantage, this makes companies work on their "look" or "design", to throw the adversary and attract the customer, who couldn't ask for more.

Without naming them all, we've hit on some of the ways to encourage working out a policy for research-development for the invention of a different company, to encourage organizational innovation in order to win with a strategic difference:

- Working with entreprenauts to identify innovative *virtual business models*;
- Customer involvement in the new generation of *virtual business models*;
- Getting employees involved to invent a new future;
- Using the community's leverage to impose a model.

184The Netcentives formula was developed by clickrewards.com who buys air miles at a discount from airline companies, and then offers them in point form to sales sites. These then use the points to encourage surfers to buy their merchandise, and Netcentives makes money on the management of point accounts for the cybershopper.

2.1. Working with entreprenauts to identify innovative virtual business models

Entreprenauts are inventive troublemakers who, thanks to virtuality, manipulate a combination of organizations and industries in order to bring together economic players in a new niche that's likely to create wealth. People from the sixties think that all of this is done just to impress us, an improbable reality, just manipulation by the media more than a new economic reality. However, a new way of creating wealth is shaping up right before their eyes and they'd do better to take notice and be inspired for the future of their companies.

The American Charles Schwab, who launched the first and most important on-line brokerage service for the stock market using the telephone and the Internet, has become a symbol for small shareholders in the cybereconomy just as Michael Milken from Merrill Lynch with his modern financial instruments was for the small and medium-sized companies, businesses and industries. One out of six stock transactions takes place on the Internet in the US where there are more than eight million shareholding families. Charles Schwab, who revolutionized the brokerage business with the Internet, covers 30% of the US market and greatly surpasses the stock value of his distinguished rival, Merrill Lynch.

First of all, the service is open 24 hours a day, it has the lowest prices with the use of direct telemarketing, skirting the institutions and relying on a myriad of independent consultants. Schwab offered to free them from administrative and transaction management and gave them tools to help them in their role as financial consultants. The operation simplified life for all and increased the productivity of the company's specialized firms, creating a network of over 6,000 agencies without cost increase. The step changed the rules of the game for the profession and cleverly used information technologies; a business mode that weighs in at 6 million accounts of which almost half were managed on-line in 1999.

Another way that the neteconomy has called into question the traditional business models is illustrated by grouped buying. A French team launched Appeldoffre.com, a website that groups public and private bids, and it has become indispensable for businesses. An American team did the same thing for business relations between France and the US. New kinds of intermediary organizations are springing up all over as they look for the most profitable formula, economically speaking. Missim Avershal got the idea in his head to change the way of modern trade. A little over a year ago, in Switzerland, he opened his website of virtual cities called Global Knowledge Base. His idea was to develop grouped services for citizens. In the first experience, each citizen estimated his fuel needs for the winter: Missim Avershal totaled up the demands and went negotiating the purchase with producers or wholesale retailers and took a commission as the middleman. He became a specialized buyer; a function that we will see develops for the benefit of numerous small businesses who outsource for skills that they don't master. This *virtual business model* of virtual purchase centers is rapidly expanding.

Accompagny, a California business, offers grouped purchases. Along with the other central, Mercata, Accompagny makes it easier to buy packaged offers whose prices decrease as the number of buyers interested in the same product increases. The offer might be valid for a limited amount of time and for a varying palette of products, but it shows the growing power over production and price-fixing that cyberbuyer's organizations have.

After some hesitation due to rivalry between firms, these groups (marketplaces) invented by some daring entreprenauts touch a growing number of professions and businesses that have all benefited from association. Prisme is an interprofessional central for grouping and dividing into smaller groups, specialized in book delivery for an association of bookstores. All of the books are supplied by editors and sent to a Parisian platform managed by associated transporters who manage the deliveries. This formula of concerted cost reduction satisfies 96% of all users and could someday be used by other branches of industry[185]. The success of the Citius strategy, as we saw earlier, shows the advantage of associating virtuality and reality, rather than trying to put them in opposition.

The value of a business is linked to the supposed performance of its model, to the relevance of its concept. The weak point in traditional businesses is to ignore how to use new virtual organizations. The weak point in the cyberbusiness is to bet on total virtualization. The strong point of the traditional business is to know how to organize its logistics; and the entreprenaut's is to imagine that the modern business plan is more than a projected business account; it's a series of financial scenarios where a *happy ending* is expected in the form of a positive growth curve, extremely positive in the best situations. These original models are at the start of 20% to 25% of stock capitalization in North America, according to Mercer Management Consulting.

In the end, competition between companies is established on the basis of the business model that is the most interesting for the customer and on the most reliable scenario financially. The compromise between these two approaches resembles the adaptation of the airfoils on modern airplanes that could manage sub and supersonic flight plans. In other words, collaboration with entreprenauts has to end up with robust organizational models that associate reality and virtuality in order to "behave correctly", no matter what speed of flight they take.

2.2. Customer involvement in the new generation of virtual business models

No other technical invention has made the market economy evolve as much as the virtualization of organizations. Neither the traditional mold of products/markets nor those of technical innovations processes include a breaking-away from the organizational model like Dell's. A new relationship is forming between suppliers and customers. A new notion of convenience is taking hold, decreasing the cost of access to services or products for the customer. From one counter and for a low price, a private customer or company can comfortably access an unbelievable amount of services.

This new idea of convenience, an original virtual business model, lets companies depart from tight price strategies caused by rival constraints, and develop an interaction with its market, its customers. It's a way to escape the rivalry of comparative prices. In order to develop relationships based on unique service, that by the way usually increases the psychological value of the product for customers, a company needs to, first of all, incorporate it into the model in question. Alvin Toffler, in the sixties, brought out the phenomenon of "prosumerism", self-production of goods. It meant that the customer himself participated in the value chain, for example by assembling his kitchen or a piece of furniture, allowing manufacturers to cut sales' costs. Today, with virtuality, musicians can record their own CD,

185Source: Les Echos, February 8, 1999.

distribute it and promote it directly on the Internet to test the reaction of their potential customers before organizing traditional concerts. Then the construction of added value can include a whole package of derived products: attending recording sessions, video cassettes of concerts or practice sessions, participating in chat rooms with the artists. But in this same world, the final customer can decide which pieces of music he wants to record by downloading instead of buying the finished CD.

From now on, the customer is part of the business model, yet another revolution in an era of upheaval. Yesterday, he was an outsider to the model: everyone was happy to supply the customer with a product with the most modern companies conducting surveys about quality or quantity, using specialized survey organizations Today, we let customers freely use part of our growing services in order to build up a loyal public for a brand of software or an on-line service, and we often ask his opinion.

The French company Spora, specialized in hospital uniforms and equipment, swears by the Internet. When a customer or doctor gives his opinion for a new product, the company uses the Web to consult similar companies in the world, looking for new suppliers, hence creating new special links with other professionals in the business sector. Thanks to their intranet, product managers for the French home appliance company, Calor, (approximately 257 million dollars), can be more in tune with their retailers. They have reduced the time it takes to develop a new product to twenty days from the drawing board to manufacturing, and to about two days for a variation on an already existing product. The company exports 74% of its production and the reduction in time for the cycle gives it a real competitive advantage: resourcefulness. It's no secret that German companies who use the Internet have a growth rate that is twice the others, as estimated by the firm Roland Berger & Partners after having studied 120 big German companies[186], conclusions that corroborate the INSEE study already cited.

The wealth creating process becomes collective when companies encourage customer participation. The customers are now partners in the process. The phenomenon spread when software companies turned to outsourcers for their "debugging" costs. They offered free beta test versions in exchange for information when a problem with the software was detected. They modified their organization in order to process any problems that were found directly on their Website. The customer is now a proactive, proconsumer marketing tool: he says what he likes or dislikes about the product or service. The financial benefit that he gets out of the free use of a new product is supposed to be the thanks for his cooperation with the constructor. In other words, instead of building a self-centered catalog site, some companies prefer to use a marketing method based on simple and economical "listening" to their customers.

2.3. Getting employees involved to invent a new future

If the way to continuously adapt and improve products and services means better listening to the market, the continuous transformation and improvement of organizations means better listening to personnel. A company should first rely on its resources to invent a new future in order to prepare the organization and its employees for change.

186Enjeux Les Echos, October 1999.

To help prepare the way to the future psychologically and physically, the tendency is to associate the maximum number of people in a *dream team*, a team that will invent a new service or imagine a different company. The team works towards the employees' strongest hopes and, contrary to the traditional diagnostic of strong and weak points in the company's portfolio of activities, it doesn't turn everyone into hypochondriacs[187]. It preserves positive construction for a better company, perfectly adapted to the future. The imposed, frequent exercise of looking into the future and imagining the future company is a gold mine of wealth creation using new and unique organizational models and business designs. The dream worlds described in chat rooms, sometimes written down as scenarios or short stories, are bridges between the real and the virtual. It's useful material that helps redefine the business in the course of history. In the end, a company, along with its products, should be able to imagine several different scenes for the future, like a movie in the making, it should be able to suggest several different endings, that's to say several versions of its future, its products or its services.

The objective for creating dream teams is to push in-house teams into imagining what the company might be like in six months or six years from now. Where are the breaking points that could be dangerous or beneficial for new growth? Remember the example of Jack Welch's team who started the new group "destroy your business.com", calling into question General Electric's branches of industry. It's not a new way to work, but it needs to be updated and more global, taking into account the feedback from intranets. At the end of the eighties, Thomson CSF brought together a group of 150 experts in a scientific and technical college. The college, whose members kept watch over their specific fields of skill, was supposed to stimulate scientific and technical thought in many different areas in order to develop transversal, multidisciplinary projects. In the nineties with the coming of intranet networks, the concept that had been reserved for a small group evolved and reached all engineers who wanted to confront their ideas with others in a virtual community dedicated to the company, with the possibility of inviting representatives from other companies. The oil company Elf has the habit of getting in-house multidisciplinary teams to meet regularly to talk about various subjects. A watch has been permanently set up to identify and research any major changes that might affect the company's strategy and organizations.

The L'Oréal group invites "catalysts" from all horizons to come share ideas with its collaborators. Several spokesmen from the group travel the world over listening for weak signals and meeting avant-gardiste people who are sensitive to the way the environment and society evolve. These are often "troublemakers" for the establishment who use their ideas as catalysts in the different in-house departments of L'Oréal. Strong ideas are the ones that are reoccurring and for months they are worked on and rethought until the concepts and new ways of doing things are implemented in the changing areas. New business models work like this as they are faced with the sudden growth of new inventions that come with the Internet, and since 1999 they are the object of a large number of written articles or conferences.

International *dream teams* have other advantages that favor multicultural, transversal exchanges that make a common base of shared skills. They help companies work in a different context than that of performances compared to services. The different teams discover that they all share common preoccupations, common ideas and that together they can advance

187Any doctor…or business consultant…will tell you that anyone in good health is a potential patient!

on projects that they couldn't manage alone. The French group Altran goes even further. All of its employees are considered researchers. The company decided to create a foundation whose purpose was to "create a bond among 6,000 employees of the group scattered in 70 branches"[188] by launching research projects proposed by employees, and by fixing a price, an advertising campaign and a strict in-house follow-up.

When we realize that more and more products have failed and that in order to limit the cost – that can reach several tens of millions of dollars – we plan to simulate future launchings, why not apply the method to the evolution of organizations? The ability to project into the virtual, in a hypothetical future situation for an organization, can no longer be considered a non-productive dream. Today's utopia is tomorrow's reality, so they say. The projection into the future is without a doubt the common ground for these still unusual procedures. The most daring can have their wings clipped by traditional directors giving them the cold shoulder or just from company routine, and its important to protect these "court jesters", these inventive opponents who detect factors that will make the company move. Companies are always analyzing their past but if the future is to be prepared, they need to "start cooking" with their employees, a vision of the future…the place where they're going to have to develop themselves.

2.4. Using the community's leverage to impose a model

The use of forums for community lobbying is a powerful arm. Connoisseurs will remember what happened to the Fox company in 1998. The distributor started a series of coercive measures against volunteer internauts who had created websites for their favorite movies. Fox demanded that all music or movie clips be taken off the sites. It didn't take long for the angry fans to launch into boycotting operations and their signatures of protest were sufficient enough to make Fox abandon the affair.

The lever effect can transform the Internet into either a marvelous or a dangerous instrument of propagation. The fictionalized history of Akihabara is a good example of amplification by "gradual contamination". This quarter of Tokyo has become a brand new, internationally-known part of the city, quite by accident. The quarter of Akihabara is a concentration of all electronic and computer equipment that you can buy or swap. It all started in 1998 with a Japanese novel that changed the image of the cyberquarter, giving it a body. The novel tells how some children from the neighborhood were found dead after having used the same video game, and this is the beginning of a police investigation of pirated games, a sort of contemporary fairy tale. The novel first gave way to a comic book, then Toshinari Shimakawa, a former employee in an electronics store and a resident of Akihabara, continued the novel and published it on the Internet as a chronicle that tells about life in the quarter, using little touches and anecdotes. The initiative was successful and it has been relayed by a growing number of others. The quarter of Akihabara is now famous on the Internet.

188Michel Friendlander, general manager, quoted in Enjeux Les Echos from October 1999.

"Gradual contamination" works like this: you sell to your family and friends who in turn become salespeople selling to their friends who also become salespeople selling to their friends, etc. On the Internet, usually using chat rooms and forums, the initial sender incites a first group of people to relay information or offers to others. With the help of promised gifts, commissions and other knick-knacks, the rumor gradually spreads.

The Blair Witch Project, a movie with a derisory budget, surprised everyone when it shot up to be number one in the world's box offices. Its team used the Internet to promote the film: the movie's storyboard was associated with real events before and after it hit the screens, thus creating a virtual and imaginary dimension of reality. The contamination effect can be kept alive for a long time and spreading rumors are good publicity; most companies have ready access to the method but they seldom use it, yet.

The role incomes to new infomediaries who use "viral marketing" techniques in a series of targeted messages to sensitive markets on the Internet. Infomediaries, who are specialized in telemarketing, have access to a customer pool and they run one or more virtual communities. They know the people they're dealing with and sometimes act as sales advisors in many different areas. Without hesitating, they use e-mail to offer gifts in order to get a chain response to all that they have to offer customers. These are the traveling salesmen of the cybereconomy. They intervene in all areas: buying a home or a car, the choice a particular school, they advocate for this website or that interesting event on the Internet. In short, they're "convenient" for companies who want to come into contact with specific communities, who wish to use customer panels to help develop or test their offers and at the same time impose themselves in neteconomy markets.

Spurred on by new intermediaries, with very little money, an army of fans or employees can participate in diverse chat communities, offering services and sales of all kinds. Betsy Streisand from the US News and World Report in Washington[189], tells how Steve Martin's and Eddie Murphy's fans bombarded websites that are popular with the Saturday Night Live generation, with talk about their movie Bowfinger. To put it clearly, they were hired as contaminating agents, and there's no doubt that they could be used to spread rumors or participate in harassment operations on particular websites or against given companies or institutions. The method is more precise and a lot less expensive than traditional TV advertising campaigns or non-targeted offers for on-line services that flood the general public.

3. New management logic

Daily problems come first in priority for company managers and big ideas about strategy, that take up so much space in specialized magazines, come second. For the majority of executives, the company's daily life is simply the result of ongoing problem solving for little things that mobilize management and employees. Everyone knows that there just isn't enough time, and often financial resources, to make "the difference". In many cases it's opportunity that replaces strategy. The search for competitive advantages is very often linked to high skills and reasonable prices in order to work with principal companies and, above all, with a good network of relationships.

189 Courrier International, October 6, 1999.

Human organization can be described as anything but naturally efficient. Management knocks itself out more often in trying to limit common operational problems and in resolving ordinary conflicts than it does in building new strategic projects. We can say that a company's destiny depends mostly on exogenous factors, coincidences. Chance, even luck, plays an important part in its evolution. Management's role in change is not always as important as we'd like to say. According to those who hold to the Boston Consulting Group's theory, the US success of the Honda motorcycle came from a planned, deliberate strategy to attack the market with massive production of low-priced small cylinder cycles. But the fact is that when Stanford professor Richard Pascale went to Japan, he heard another story. The Honda 50's success was the result of a combination of circumstances that the executives were able to use wisely rather than a deliberate strategy[190].

Also, instinctively, executives imitate models that work. However, today with the increasing number of new models that develop thanks to electronic networks, it's paradoxically the end of models. Points of reference are changing.

Virtual organizations, as virtual they are, have a real influence on management logic, and they take on numerous forms. Among them, we have chosen five for discussion:

- Favor opportunist management over grand strategic plans
- Develop federated management
- Become a relationship-oriented company
- Listen to "undertones": use the old techniques
- Have customer-oriented logistics: virtualize your organization.

We won't go so far as to assert that these are new criteria or conditions for excellency in virtual companies, but then again…

3.1. Favor opportunist management over grand strategic plans

When we observe daily life in a company, we come away with the impression that managers aren't expected to transmit a vision or strategy, but rather to reduce uncertainties. The management's supposed determination to work on strategy or more simply to define ambitious goals, is more often just for show. Most decisions coming from the management's offices are the result of chaotic relationships between the intermediary ranks of the organization, they themselves in relation with their markets. If management ever decided to make fundamental changes without the organization's approval, the result would be a power struggle ending in failure!

The specialized press is chock full of sophisticated thoughts about management methods and strategic models. But in reality, a company's management should first have a keen sense for opportunity and be capable of acting quickly. This also means we mix up strategy and tactics,

190See Patrick Barwise, London Business School, "Stratégie delibérée et stratégie émergente", Les Echos Management, April 26, 1997.

a word that has practically disappeared from management jargon. In the method OST (objective, strategy, tactic), we've forgotten that the tactic mode is the best one adapted to today's compacted time allowances, forcing us to delegate more and more to the field and to rapidly adapt to situations, to evaluate business or development opportunities that flow with the current. The *gross plan* has indeed lived, we have to think and especially act quickly!

Our strategic conception is still based on a warlike vision of the objective we want to reach, often paying the price of so much effort and sometimes, so much damage. Reality steps in, putting a wrench in the works and changing the initial idea's or project's course. The Asian conception tends towards a more opportunist way of working, the gist of which fixes the goal of seeking and using events and conditions for one's own good. In the oriental strategy, there are only easy victories. In the occident, victory is usually won after having spent endless hours of superfluous and costly energy. The oriental, on the other hand, puts combinations of circumstances to work, using the latent energy of his players. This doesn't mean that there is no long-term, clearly-defined objective.

The basic conditions lie in its simplicity, quickness and ability to continuously adapt at low-cost. This is impossible for overly structured systems. Whatever the final decision may be, the problem almost always comes from the resource allowances and their price. To say it differently, it comes from the energy (money, factories, people, etc.) that the company spends to reach its goal. What's important is to be able to quickly interpret chaos, keeping in mind that the major constraint isn't to make decisions but to get going in the shortest possible lapse of time.

3.2. Develop federated management

The modern business has a double life: it's present in the real work field and it's also part of the virtual world of networks. National and electronic network citizenship: teleworkers, just like future virtual businesses, will have dual citizenship. In concrete terms, that means that a company will be, on one hand, a member of a physical, regional community with which it will develop its traditional citizenship, carrying out transactions that are meant to improve its daily operating conditions (employee training, taxes, research and development support…), and on the other hand, a member of a virtual professional community, with no country, incarnated in electronic networks. Virtual businesses have to learn to manage their local and distant duality, the "proxi" and the "tele" part of their tangible and intangible existence!

A motley number of network structures without centers or boundaries, structure themselves by skill or activity areas: they use federated management because it's the only kind of direction that can bring together the interests of all concerned parties. At ABB, the new boss, Göran Lindhal, wants to change the matrix-type organization limiting the geographical structure to national boundaries, which rids the company of regional management and reinforces the division of ABB into organizations according to product lines. These branches of activity are by nature more interdependent than geographical baronies that don't always work together collectively. They are forced to cohabit and exchange with each other because each link in the chain is customer-oriented. Management services, wherever they are, are there to serve all areas of the different activities. Each unit answers to central management, that is to say headquarters, who arbitrates resource allowances and intervenes in case of coordination problems.

Federated management seems to be a good solution for network businesses who have reached a considerable size or for meta businesses. Although it's often misunderstood because it's culturally removed from typical French centralism, it has the advantage of keeping both notions, centralization and decentralization, and of allowing different sized organizations to work together. Federation has another distinctive characteristic that we have mentioned throughout the book, that is to rely on subsidiarity; in other words, always leaving the decision-making to the organization at the most competent level, letting each link assume its own responsibilities according to its activity. This formula allows a supplier who joins the federated structure to become an associate with a pre-existing organization without any major management problems, and at the same time avoiding the service congestion inherent with a central headquarters.

Every kind of structure has its advantages and its inconveniences. Decentralization was expensive to structure, centralization was expensive to run. In a hierarchical, centralized system, the power of NICTs helped information processing and circulation, but not necessarily the ability to act out in the field. All too often, information, summaries that are made in headquarters, don't make it out into the field because they are used as influential levers or for power struggles. Federated management is small in size because its structure is able to think globally and act locally. The management considers that each work unit is able to carry out tasks locally that used to be done by a central office. ABB for example, who federates several hundred companies, has only about one hundred people working in their central headquarters. Federated management simplifies the chain of command, which doesn't mean that the chain's importance is reduced–on the contrary –its functional approach is different. The problem is to be able to make decisions in a scattered organization without being chained down to procedures, meetings and unending discussions.

In a different way, decentralization creates an autonomy that can range from a certain indifference about the entire company's destiny to a dissident barony. Centralization, with its one track way of thinking, serves as a brake to operational flexibility and to resourcefulness out in the field. Electronic networks changed that. With spectacular cost reductions for transactions and coordination, we can imagine a change in the management system that will leave more autonomy for operational or functional units. The latter are able to adapt their transactions in order to reinforce their coordination and their self-regulation with other partners working on the same assignment. Self-organization is necessary; the hierarchical functional system changes into a very sophisticated system of coordination that, in order to limit the loss of energy, is controlled by a group of standards:

- technical standards with computer systems or "inforganizational" components that allow collaboration;
- legal and business standards that control contracts where hierarchical order is replaced by the "direction";
- functional standards that respect procedures, sharing tools and resources;
- cultural and relational standards, built up through regular contact among individuals in a common interest community sharing the same objectives, the same destiny.

In the context of globalization and organizations that change with the wind, the future for virtual business management seems to lie in federation. The network becomes the system for organization and coordination. There's no longer a reason to talk about central "government" but an interactive group assisted by computer networks that regulate and coordinate the opposing armies. The community of participants uses a common work method. The standards for collaboration lie in the technical network that memorizes and structures the exchanges among numerous professional communities.

In the beginning of the nineties, the Cap Gemini offices, number one French company for computer consulting, functioned autonomously in all areas (business, sales, production, management…). The company was really a federation of small and medium-sized businesses, each one responsible for its own area of action. The launching of the project Génésis, whose set up took several years, fundamentally changed the organization that needed to work in proximity (be with the customer) and work at a distance (using group skills and know-how wherever they were located). The double constraint made in-depth changes in the company's structure and culture with the opening of transversal functions with its *skills centers*, units that were dedicated to particular types of customers and specific activity areas. The federation of small and medium-sized businesses was no more; it was replaced by a federation of skills virtually united by an in-house intranet that became the Génésis network.

But federated management isn't the cure-all. The long-term vision is difficult, except when a community is dominated by an economic or charismatic leader as in the case of Benetton. All long-haul investment becomes tricky. That explains the important role played by common "service offices". The total decentralization of players makes it absolutely necessary to have platforms taking the role of "virtual industrial districts" that centralize, answer and analyze everyone's communications in forums. We're just at the dawning of an era that will see an increase in players who are interested in *groupware* or collaborative work, but also in cooperative training. People have only just begun to ask for standardized applications allowing them to format work in groups and at a distance in virtual mode.

Moreover, the federated structure has to be accompanied by a big investment in group leaders and an acceleration in the intermixing of people in transversal projects and between the different companies that make up the meta organization. At Oticon, the Danish hearing aid manufacturer cited earlier, the organizational model comes under the heading of an "adho'cracy", a type of democratic government that builds circumstantial relationships between different partners. Its project structure is extremely malleable and suits virtual type organizations. People coordinate according to the circumstances, the objectives and the readily available resources for the project. The market's logic gives coherence to the exchange flow between partners. However, leadership investment can be quite expensive because organizations are ephemeral.

Paradoxically, in the age of distance-working, people move around and are in closer contact with each other than ever before. Federated management strongly requires relationships. In face of the destabilizing traditional organizations, managers have the reflex to use ready-made

answers for problems that never existed before. If reporting is the rule, the increasing number of intranets will never compensate for the importance of feeling concerned by the life and future of the business. Only a strong culture of relationships can compensate the risk that distance-working and its tools will become too heavy to cope with. The pleasure of meeting others should compensate the necessary rigor of modern telework.

3.3. Become a relationship-oriented company

Companies come from an era where management culture was very hierarchical, only the bosses were allowed to talk among themselves. Things have really changed since then. Operational or functional units are more autonomous. Everyone talks to everyone and does it so much more easily since telecommunication tools amplify the phenomenon. The number of employees who carry out transactions with participants, suppliers or customers has really exploded…In other words, with virtualization, the company has increased the number of relationship networks to better manage its business. It's no longer the communications manager or a few directors who represent the image of a company, but the whole group of employees who cooperate or collaborate in relationship with a growing number of outside organizations.

It's an intangible economy that increases the exchange of ideas and knowledge, using networks out of necessity. In order to find its marks, the fairly unstructured organization will go from individual specialization, labor skills, to network specialization. The company has to go through this phase in order to self-organize or self-coordinate complementary areas of activity. In other words, we see the restructuring of the organization into professional branches as it naturally supplants the company's existing organization. Employees feel closer to their own professional branch than they do to the company's tribe. Some regret this "mercenary" tendency; others are happy to use it without any particular problems, "mercenaries" are always ready to work and use their skills network for their employer of the moment. In an economy of knowledge and relationships, characteristic of virtual organizations, functional or operational units are more autonomous, forming and managing collaborative relationships that are as enriching as possible, as in the Reuters example. Also, in any given economic or industrial sector, even if the same technologies and methods are used, a company will always stand out by the relationships it has with its suppliers or customers.

In a strongly interdependent organization, relationships are key factors to the success of the professional community. When a company develops relationships, there are positive repercussions in all areas. It helps encourage recruitment by co-optation, helps find new customers, and attracts freelancers and members from other companies or professional communities to work with the company from time to time. All of the people involved will carry the company's image in one way or another, to the outside, giving a good idea of how the company and its managers work.

The social dynamics of the new world order, especially the increasing amount of collaborative work, has created a new phenomenon, the importance of employees - their know-how, their skills, their intellectual potential - and their ability to work with the intangible. Today employers have to recognize that their work force is a free-flowing investment that has to be

fed, cultivated and captivated to optimize its value, and in the end, to insure the company's good health as it advances. When employees' involvement in the business stays theoretical, they quickly lose any vague desires to be motors in positive relationships. Management doesn't always pay attention to the new order: all participants are capable of contributing to the growth of intangible capital, including the company's positive image.

Gemini Consulting published results from an international study[191] showing that, in general, employers fall way short of their employees' desires. It's no wonder, then, that there's a shortage of "loyalty" in the international world of work. In 1993, 64% of American workers that were surveyed considered themselves "very loyal" to their company. Five years later, in 1998, the study showed that two thirds of the employees in the world would leave their job immediately for a better opportunity for advancement and 10% for a better salary or better work hours. The increase in the number of freelancers - estimated to be 25 million in the US - illustrates the phenomenon: dissatisfied employees develop other ways of working. The study raises the question: "What does hiring and keeping good employees have to do with getting and keeping good customers and satisfying share holders?" The answer is: "Everything!"

Hundreds of employees from 500 businesses cited in Fortune were studied by MIT and the Sloan School of Management. It became evident that there are systematic links between employees' loyalty and the company's performance. Thus, among the first 10 companies on Fortune's most-admired list, 9 are also recognized among the top 50 companies that know how to attract and keep talented people. Hewlett Packard, known for its efforts to foster good business relationships, was number 5 on the list of the most-admired companies and number 15 on the list of companies that know how to attract talent. Maybe that's one of the reasons that Hewlett Packard, with an annual income of 42.9 billion dollars, went from the 11th to the 3rd position for worldwide computer manufacturers.

The stakes are high, good quality relationships in a company helps decrease coordination and control costs for the whole value chain, with in-house players and outsourcers involved in the procedures. A "control panel", specifically designed for collaborative behavior, becomes absolutely necessary to identify and evaluate relationship parameters. In the eighties, we developed a method for analyzing relationships in an organization[192] that was preferred over the traditional diagram of communication directions. Each intervention gave the occasion to discover that beneath the functioning layer of the organization, the official flow chart, was a real business, the one that worked hard while avoiding lazy, difficult, dishonest or incompetent people whenever possible. The method showed the real company carrying out transactions between the most motivated employees, those who trusted each other.

191"Capitalisons sur la révolution du monde du travail internationalisé", a Gemini Consulting study published in 1998 by Jayne Buxton, Pierre Hessler and Crystal Schaffer; the study followed 10,339 people working in Europe, Russia, Japan and the United States.

192The analysis of the attraction involved in relationships in an organization analyzes the frequency, the importance and the priority attributed to a relationship between two or more players; it gives a picture of the relative strength of the covalence.

3.4. Listen to rumors: use the old techniques

Today's impatient society forces companies to adopt very opportunistic attitudes towards partnerships and also towards markets when launching a new concept, product or service. The Web helps find the best interest rate for real estate, helps inform about the latest public interventions of competitors on the Net or in conferences, helps identify a product's disappearance; these are all well-known ways to use the Web for internauts. But it's much more difficult to discern hidden logic in databases, to identify forerunners that will become tendencies for future consumer needs. Ephemeral markets or fashion cover all areas , even the computer sector. The designer of Apple's Imac understood this and came up with offers for "the Easy PC", colorful, performing micro-computers, able to be customized, in short, in fashion!

The trick is to anticipate early on any possible future events and changes. In order to do that, you need sophisticated computer programs that can identify and follow any little sign of possible changes in the network thus anticipating unusual situations. Finance was one of the first sectors to use the mathematical applications of Benoît Mandelbrot[193], a researcher and professor, that organizes chaos. It involves identifying as soon as possible the "undertones"[194] that are often signals or forerunners of coming disruptions.

"Undertones" can be detected when there's a break in normal surrounding noise. In November and December 1997, the FBI dismantled professional networks on Wall Street that were operating on electronic markets and manipulating the prices of *penny stocks*. The Mafia was involved in the tiny but repeated manipulations carried out by NASDAQ middlemen and the money involved added up to large amounts. These transactions would have gone unseen if specialists hadn't notified the Securities and Exchange Commission (SEC), the stock market police. The increasing amount of nano-operations is a result of virtual markets: penny profits become an interesting value thanks to electronic networks.

The innovations already in place in the area of finance will rapidly spread to other sectors. The tools that were first reserved for keeping an eye on leading values on the stock market will be developed in all areas over the next decades. They are really prediction tools, that watch the "weather", the behavior of an organization and they've become a necessary part of cybereconomy's markets. According to the guidelines for intelligence agencies, 90% of all useful information is easily accessible, 9% remains and is not given out very often, 0.9% are truly confidential, and 0.1% doesn't exist yet. This empirical law applies to cybereconomy too, with the exception that sophisticated tools connected to networks can pick up "undertones" in billions of pieces of information that aren't detected in any other way. Specialized "spy" software can collect "undertones" that are little breaks in the normal background noise of an organization or market. Pericles is an alarm software used by big banks to detect modified behavior, anomalies in the surrounding noise.

193Benoît Mandelbrot, 75 years old, is a specialist in the field of mathematics applied to chaos. A professor at Yale (Boston), he has worked on economic fractals and disruptions on the financial market. The results of his studies were published in his book, Fractales, hasard et finance, Paris, Flammarion, 1997.

194The expression "undertones" is used in the medical field to describe the first signs of a developing medical ailment . The earlier that they are detected, preventive action can be taken and the future patient might be saved.

It has become so important to be able to have access to barely perceptible, strategic information that common interest groups are forming to collect and master basic knowledge that will make a strategic difference. The problem isn't just to be on the Web, but to be hooked up with the right business community, the one that has the best surveillance instruments and market analysis. In face of the integrated meta networks of Toyota or the Honda group, eight household appliance manufacturers, Lion, Unicharm, Shiseido, to name a few, and Intec, suppliers of advanced telecommunication services, formed a network of meta corporations known as Planète. The network is an organic link between the different industrial players, the hundreds of wholesale and retail dealers who carry out transactions on the Planète network. Intec's role is to standardize exchanges with its PVN (private virtual network). Intec's PVN also favors the development of sub-networks between partners who share marketing information and work together in forums in order to optimize their industrial or commercial organization[195].

Partners using common marketing data are forced to have an open attitude of sharing information that each one has found in their own business, thus modifying the attitude of rivalry. They prefer to strengthen each other in an organized professional network. Cluster businesses following Planète's example, will implement common platforms for surveillance and automatic research for precursory signs in their field of activity. They will be better prepared to anticipate, prepare and adapt their industrial organization in time to meet coming changes.

3.5. Virtualize your organization to act quickly

Be informed and then…know how to act quickly. Opportunity only knocks once, they say, and a combination of circumstances needs the right information at the right time in the right place. That's the game modern businesses have to play. They need to have the best conditions in order to make the most of the best opportunities that come their way: the question is no longer, "How much time do you need to put an idea into action?" but rather, "How long do you need to make this product or to deliver a service?" If I know what the customer expects, I'll be able to anticipate the answers. If I don't know the answer myself, will I be able to gather up the skills needed to rise to the situation? If I know how to bring the needed skills together, do I have the reactivity to be able to do it almost immediately? If the answer is yes, let's start over again: how much time do I need to put an idea into action without causing a revolution in the company? Is in-house resistance so strong that it can't be resolved in time to deal with your customer's problem or with a prospective customer?

Or maybe your information system doesn't allow you to answer global questions within a reasonable amount of time. For example, "Could you agree to the same sales conditions for our different branches in the world?" "Could you send me an estimate for your help with this problem in all of our different departments?" Do you know what to answer? How long will it take you? Telecommunication infrastructures won't help much if partnerships haven't prepared a minimum for the development of exchanges between the different activity areas that are spread out all over. As we said before, that's why it's so important not to be content with simple message board tools but to set up real collaborative management plans that can act in real time.

195Technologies de l'information et nouveaux domaines de croissance, OCDE 1989, n° 19, pp. 70-75.

We should learn from current changes to keep some leeway in order to quickly adapt our organization to all possible flight speeds. This objective reminds us of the cost of changing tools in the industrial chain that may be penalizing enough to absorb part of the productivity of the running of the company. To dissolve one organization to build another *virtual business model* takes both time and money. This will be a major problem for future organizers. It's not difficult, as we said earlier, to imagine one or several solutions but it is difficult to put them into action quickly. The rapid modification of an organization becomes a criteria for excellence.

Simplicity, agility, and professionalism are the three necessary characteristics to manage expert and reactive logistics. The "gazelle-type" organization, so dear to the hearts of Californians in Palo Alto, is small, quick and light, but also more fragile. It is in all evidence gaining the favor of more and more managers. Nothing stops a big business from favoring functional or operational units that have certain similarities with the "gazelle-type" organization without the fragility, as in the examples of Softbank, Benetton or ABB. The permanent structure of group companies acts as an engineering nervous center who, depending on needs and circumstances, favors, federates and controls the smooth running between the specialized components of the group in order to solve a problem. The division of an organization into small, highly collaborative operational units favors great flexibility in uncertain situations and in in-house liaisons, as well as with external organizations.

3.6. Limit the logistics costs incurred by the customer

Everyone knows that when you buy a book at Amazon.com, it means accepting an additional cost greater than the modest cost of ordering the book depending on where in the world the customer lives. Electronic business, in favoring intangible exchanges, has reduced administrative costs but not logistics costs. Customers are more and more aware of this. Up until now, many businesses were especially concerned with ways to improve the efficiency of the chain and the reduction of in-house costs without giving much thought to the cost that the customers carried. Future *virtual business models* will most likely act on global logistics costs with the customer in mind. The customer knows that logistics affect the final price they pay. Poor quality logistics are associated with on-line services and are constantly subjects for contention in both the US and France.

For the lack of quality service, a former executive from IBM living in Paris decided to leave his French bank for Merrill Lynch. The French bank had to go through three different organizations just to regularize his stock-options: loans department, international department, stock exchange department. The principle is simple, IBM committed itself to sell a package of predetermined shares at a guaranteed value to its collaborators. If the offered value was interesting, they bought the shares to resell them at a higher market value. In order for it to work, it had to be done quickly. In fact, the necessary funds were usually lacking, so he had to borrow large amounts of money. That becomes expensive if the administrative procedure is a little slow, to the point where a good part of the profits could be "eaten" in the process. Every

time, that is at least once a year, the executive was dealing with anonymous and different people. Every time, he had to go through the same red tape in order to open a credit application and loan guarantee, to buy before he could sell his shares. Every time the procedure took several weeks. Then, it could take more than three weeks between the order to buy and the order to sell, during which no one knew what stage the process was in.

Following a friend's advice, the executive called Merrill Lynch in New York. The person on the other end spoke fluent French. As soon as he exposed his need, the person from Merrill Lynch organized a phone conference for three with the correspondent at IBM headquarters who was to confirm operations. The person at IBM was not in, so the Merrill Lynch representative left a message on his answering machine, took down all the references from the French customer and sent a fax directly to IBM with a copy for agreement to Paris. Furthermore, the rep from Merrill Lynch sent UPS to the Parisian customer's home to pick up the original portfolio for the next day at 4 P.M.. The person excused himself for not being able to give the purchase order on the same day. Upon confirmation from the IBM representative that the operation was valid, a line of credit was opened at Merrill Lynch. The portfolio was received the next day, the guarantee taken and the orders were given. The executive now could sit back and watch the variations of the prices on the Internet. One and a half hours after the order to sell was sent, a confirmation came by fax and a few days later the orders for sales, and the corresponding credits to the French account. All in less than one tenth of the cost that it took for the big French bank, still organized like in the last century. Today Merrill Lynch makes regular offers to the Parisian customer keeping him posted on shares for companies with which he works.

The Parisian bank had never dreamed of such a thing because it never imagined that it should make logistics useful for its customers. The bank, as do many other companies, considers logistics to be an in-house tool. It's not made for the customer but for the organization's efficiency. Once again, intense technology isn't the cause here, we are dealing with businesses that have an organizational shortage that will put them way down on the ratings ladder for not adapting to the network century. Knowing how to organize its logistics to better serve the customer and share the increase of productivity is a key to success, a differentiation element. Faced with the competition from Amazon.com, it's an asset that Barnes and Nobles counts on as it adjusts its strategy for better use of its traditional network in order to win in differentiation on cost and efficient logistics as compared to its rival: the challenge becomes the eight hour delivery.

Businesses like Aquarelle or Net-flowers.com, sell bouquets of flowers on the Web and send them all over the world, relying on networks of traditional florist shops with whom they have made agreements for distribution. Again, the problem is to find the "flight plan" that brings together the strong points of traditional and virtual organizations. The *business model* has more advantages for everyone, including the customer.

4. The evolution of development strategies: the end of models

Living in a stressful society, we look for ready-made models to hold onto, and the hardest thing to do is to get away from clichés, from what we could call the "ready-to-think". We see a diversity of models being developed that will lead to the extinction of future companies. Some models will become more important than they were in the past because they fundamentally change organizations. But we also need to change our way of thinking about economics and our relationship to that which can be described as "proxi" and "tele"[196], in order to revise our ideas about globalization. Globalization comes up a lot in conversations and, contrary to common clichés, it isn't totally negative.

When Johns Hopkins Hospital in Baltimore, specializing in prosthesis, heard about a war on the Peruvian border, it contacted the Peruvian government to offer its medical services for the wounded. Thanks to diplomatic networks, it negotiated a contract for several thousands of dollars. Since then, the hospital has increased its negotiations with other areas in the world that have local wars[197]. For Johns Hopkins, and several other hospitals like Tampa Hospital in Florida who specializes in transplants, health is a business. Hospitals don't hesitate to go looking abroad for customers in order to make a profit on the skills of extremely specialized surgical teams. Johns Hopkins Hospital even created a marketing department, sales representation in Washington, and is starting a series of conferences for targeted customers, that is those concerned with prostate cancer treatment. It pays. The Baltimore hospital cared for 610 foreign patients in 1994 and 4,400 in 1996.

For many European hospitals this action is sacrilegious. However, the pharmaceutical industry makes its money by using an international marketing approach . Why should the procedure be forbidden to specialized health teams when their formation and maintenance costs a fortune for a nation alone. The costs/profits for different hospital departments is already changing with the development of distance monitoring and diagnosis.

Furthermore, why does something become suspicious when we try to avoid total taxpayer support, as in the example for health care and training? Let's not forget that economics isn't just a way for the strong to dominate the weak by making scandalous profits, but an inescapable way of regulating human activities. Everyone brings or uses different economic solutions or organizations. Neteconomy allows differentiation by opening the door to a large variety of offers adapted to regional contexts, to specialized areas, to very specific markets, and to personal needs. It's the end of models, and when we say end of models, we mean the beginning of the search for other ways to stand out from one another, other ways to adapt to the turbulence that our impatient economy has created.

196 Adapting the company according to the relationships it develops with its customers and partners, either near or distant.

197 The Wall Street Journal NY, ""When American hospitals import patients", by CI, January 9, 1997.

While companies seek to protect themselves from the chronic instability that's inherent to modern systems in the context of international rivalry, organizational innovations will be the motor for increasing competitiveness throughout the world. It can be resumed like this: "know how to imagine the most intelligent model to create more wealth while using less resources with the least possible effort"…and selling it for the highest possible price!

Modern economics uses the formula where there is no ideal model, there are only adapted models. Competition comes in at the level of the ability to find the best performing economic and organizational model through imaginative combinations of players' ideas. The virtual business becomes a wealth creating tool.

Not a day goes by without the economic press announcing Internet alliances: between banks, automotive manufacturers, mass marketing chains…Professional branches group together and organize themselves into meta organizations, as they look for the most advantageous *virtual business model*. Networks structure themselves using and combining three types of meshing:

- First the development of intranets for the company to reinforce in-house collaboration;
- Next the development of extranets for links to the professional community and partners, with suppliers or customers who use B to B methods;
- Then the development of the use of the Internet for customer relations, the B to C method, the market could be companies or individuals that make up a customer pool united in virtual communities.

Each network structure has its own development logic that goes from the search for closer collaboration to the search for the best productivity in the logistics flow, and also the search for the best business returns through electronic business. Companies work on all three levels, using telecommunications to make collaboration easier between the business clusters or individuals working together. It doesn't matter if the businesses are small, very small or very big. The size of the company is secondary, it's the size of the chain that counts…and also its strength. These networks are the chains that combine more or less players (links) to create a virtual business, with the most performing VBM. The company invents its *virtual business model* when it forms a meta organization of networks, allowing it to offer services that it never could have without the help of many outside players.

It's risky to step out of the traditional business model mold, giving in to the pressure from the neteconomy, but it's also such a rich source of benefits that it's difficult not to realize the importance of "redesigning" the organization. The most improbable and unexpected organizational innovations in the world of *virtual business models* are often the results of a collaborative search for pragmatic answers. It's also a way in which companies can adapt to the century of networks by increasing the number of occasions to work together. At this stage of discovery and learning, some will be more daring than others to do business together. In this new form of competition, it's not the quantity of technology that makes the difference, but the ability to invent different organizations, "intelligent organizations".

4.1. VBM becomes a way to stand out on the markets

How can you make a 15 million dollar turnover in less than two years without buying anything and with zero supplies? Answer: invent an organization like the Wstore, computer equipment sales on the Internet. A pure product of the cybereconomy, this netbusiness put all of its strategy in a virtual model for its activities. A large part of its outside system, notably the chain of participants, contributes to the company's good results. It's a major factor in keeping the development strategies updated. Wstore is directly connected to dozens of international wholesalers. On one hand, the computer system has catalogued 12,000 articles stocked with the wholesalers who deliver within 48 hours with a reduction of 4% and 5% off the base price. On the other hand, Wstore manages a file of thousands of small and medium-sized businesses who can open personalized accounts. With that, Wstore invested in adapting on-line sales techniques to the Internet: presence in the big search motors visited by cyberconsumers; *tracking* software to identify where visitors pick up or hang up; visitor identification to recreate and personalize the site according to his preferences, equipment that would interest him over others. The site personalizes prices and catalogs according to the customer's purchase habits. A telephone call center is organized into two levels: the first serves as a reception center where calls are sorted; the second serves for more technical and accounting services. A special letter makes follow-ups and informs customers or site visitors of new products.

In this version of the future economic order, customers give their approval or disapproval for the model according to whether it suited their expectations and benefited them. They participate in judging the proposed model.

With the boundary effect gone, now one of the most important factors in business globalization is the customer's influence on prices through grouped purchases on the Internet. Some companies will have to practice dynamic price management in order to adapt to ephemeral "spot" markets, valid for only a certain amount of time: several hours or several days. There will be hard price competition. Since price differentiation has its limits for many products sold on-line, it makes businesses totally rethink their line of products and services. They will be able to pull away from part of the aggressive competition only if the originality of their VBM stands out without affecting sales prices.

Organic integration between different participants is a guarantee of collective efficiency and the formation of a VBM with high added value. Virtualization should bring an element of comfort to the customer and, at the same time, reduce sales prices. Here's an example. A tornado just blew out a building's windows. The insured calls his insurance agent, really a teleoperator, who has immediate access to the customer's file. After having checked that his policy is in order, the operator asks the customer a list of precise questions and verifies on his database that the zone was truly hit by a tornado. Once all the information is entered, the operator puts the customer through to an assessor who validates the type of repairs that are needed and the estimate to be done. After having reached an agreement, the operator looks for the best adapted company that could go to the customer's and finds out if the type of glass needed is available. He then sets up a three-way conversation with the customer, the insurer and the repair person who agree on the nature, the day and the time of the intervention. The teleoperator confirms the references of the file and the person who will follow through in the

company. It all will have taken less than ten minutes. This actually took place in the US after tornadoes hit the southeast of the country in May 1999[198]. This is an example of a model of average integration and of strong cooperation where the gains in efficiency and productivity were shared between the suppliers and the customer. What customer would refuse this service compared to a traditional one?

Along the same lines of thought, the grouped purchase sites like Last.com or Uniondream offer exceptional products or services in order to attract cyberconsumers who then are interested in more ordinary products. These chains form new ways for intermediation on markets to take place where participants share the returns. After the arrival of Accompagny and Mercata on the French market, we find Ebuyclub, Uniondream, Alibabut who, either lean on a traditional model for wholesales in finding the best reduction possible, or ask customers to set their price and then look for the product or the service that fits the bill. Subscription buying is re-looked on the Internet: Letsbuyit offers articles whose price changes daily, depending on how many people want to buy them. The reduction can go as low as 40% off the starting price. The *virtual business models* diversify rapidly and try to win the favor of a spectacularly growing population. Priceline.com uses an inverted auction model: the buyer offers a starting price and thousands of member businesses are invited to answer on call. This direct setting up of business contracts on the Net allows arrangements that are better for the interests of both parties. Companies with the most experience in neteconomy will be in a better position to worry their less experienced competitors, even if they are larger structures.

4.2. The VBM becomes an element of differentiation for shareholders

Whether a company turns towards a meta corporation or a meta network structure, the difference between the business models becomes an attractive factor for shareholders. In the context of international competition, companies that are very structured and able to perform in a stable environment, lose their efficiency in the “war of movement”. The advantage is that the objective to reduce set costs becomes as important as that of preserving a large operational flexibility. However, the combinatorial structure of a meta business has the inconvenient of being less visible economically speaking than established branches of industry that organize themselves into meta networks.

Nevertheless, the success on the stock market of cyberbusinesses, most of which are virtual business organizations, just goes to show the shareholders’ craze for original VBMs. Without a doubt, the explanation comes from the high added value that the clustered business structure can offer to its customers. It’s just as important as the simple gains in productivity that meta networks have to offer.

In California, Peapod, a partner with the superstore Safeway chain, is a chain of home delivery. It just can’t get off the ground. Products are more expensive because the distributor has to keep its margin below Safeway’s, with which it had made a home delivery agreement. The model wasn’t successful enough, delivery adventures never work. At the same time, its rival, Webvan, hits it big on the NASDAQ and becomes an Internet star. Like Peapod, it offers free delivery, but Webvan also becomes an integrated service company for the home, not just an extension of the running of a superstore like Peapod is for Safeway. Webvan opens

198L’Expansion, January 6, 2000.

the door to home delivery for film development, dry cleaning, dinners. A French chef prepares meals on order. Products are bought, put together and then divided into groups in the Webvan's completely automatic warehouse that cost one billion dollars in investments. Peapod is worth several hundred million dollars while Webvan was evaluated at 6.5 billion dollars when it was introduced on the stock market. One is an extension of a traditional business, the other is a truly innovative *virtual business model* that groups several customer-oriented businesses.

In the end, partners in a meta organization can't develop a VBM unless they are ready to agree on prices, services and goods. The global economic model is the sum of component prices that ends up to be the market price. Suppliers have to keep these prices down to a minimum. Car parts manufacturers, after having suffered from their customer's demands for productivity gains, are now taking their revenge. From car parts suppliers, they have become sub-factory design consultants bringing real added value to their customers who are growing in number, so as not to depend on only one principal customer. Along with years of productivity increases, innovations were introduced in products and industrial procedures. The result is that these companies now have a higher value than the principal customers. In 1997, the market price for the car parts manufacturer, Valéo, shot up while Renault's dropped dramatically. The power balance reversed itself. In a meta organization, the added value of an industrial product or of a service including the customer in the value chain helps create a mark-up that in-house productivity alone can't do.

Peugeot SA (PSA) chose a meta corporation structure, allowing it to reduce component costs and to change its relationship with suppliers quicker than its competitors. As an indirect consequence, its outside costs are still increasing, going from 60% to 70% of the total industrial turnover[199]. Renault took the steps with the recovery of Nissan, drastically cutting back on sub-contractors from over 1,300 subsidiary companies. When Peugeot SA launched the manufacture of the new model, the 607, Porsche participated in the gearbox development for some of the engine types. Frédéric Saint-Geours, the company's director, said that the launching of the new model had to be done with cooperative agreements because the cost of "solo" development was prohibitive[200]. Jean-Martin Folz, the president of PSA, is reserved when it comes to mergers and prefers cooperative agreements, like the one that he just signed with Ford to develop a complete line of diesel fuel injected engines. Peugeot is used to signing limited long-term partnerships that answer to the necessary scales of economy by extending the mass production without getting bogged down in the delicate question of mergers[201]; some examples are the agreements with Renault over the last thirty years and Fiat for the last twenty years. This alternative type of structure, partly cooperative and partly merger, doesn't hinder the policy of concentrating and specializing skills on industrial platforms that are shared by participating firms.

199 Challenges, March, 1997.

200 Les Echos, October 28, 1999.

201 An intervention of Jean-Martin Folz, president of Peugeot SA, during the closing speech of "automobile days" and printed in Les Echos, October 15,1999.

Financial experts are not convinced by the formula as they watch companies who were once against mergers, merging (recently Renault, Chrysler, Volvo)! Big companies have big appetites and they dominate worldwide while protecting their domestic markets. It's interesting to note, however, that the net returns for PSA jumped 51% in 1999 as compared to a drop of 26% for Volkswagen.

The optimization for accounting and taxes probably has a lot to do with the merger strategy. It helps to build profits, especially in the most interesting countries, fiscally speaking. In other words, fiscal geography also plays a role in the formation of *virtual business models*, wealth creation goes where it's the most favorable for success. That brings us back to the idea: if there's no single ideal organizational model, there are adapted models, especially adapted to factors that aren't always tied to work costs, no matter what is said.

But if these factors that make up the value chain and its predictable evolutions are well-known, today one factor will be more important in the compared advantages: the capital of friendship.

4.3. Presenting your company

A company's economic results aren't only the reflection of the company's pure performance. As far as comparative advantages are concerned, the psychological factor has a price: changing and ephemeral, granted, but all the same real. Business models that interest shareholders and financial experts are going to have to integrate this specific factor in its VBM. The capital of friendliness increases the value of intangible incorporations in a company, in a given organization. The best way to stand out in a market that's saturated with messages will be to build a highly distinctive advantage by putting the company, the meta organization…on stage!

What are some of the best strategic stunts of Boeing and Volkswagen? Both of them knew how to make their products become movie stars. Who in the world hasn't seen Walt Disney's "Love Bug" or the plane crashes and other catastrophe films that show how extremely robust Boeing planes are? Correction: the companies' management didn't do this on purpose, the movie industry just knew how to incorporate a dream into the technological objects by associating them with situations that made them useful and friendly. In the same way, the film industry knew how to worry millions of members of the audience with horror movies that gave the bad parts to computers.

Whether the upholders of absolute rationality like it or not, in an era of hyper-choice that increases the number and complexity of offers[202], the functional characteristics of a product or service are no longer sufficient to make a difference. Furthermore the differentiation will no longer really lie in one brand name since systemic services grow in number and call on associations of brand companies. The only thing that's left to differentiate is the supposed attraction inherent in the consumption of a product or a service that's offered in connivance with shared values or emotions. Another way to put it is: "I don't only sell the answer to your needs, I anticipate and sell the pleasure to use this product over all others". We no longer sell

202Traditional tactic used to fool the competitions comparative analysis and limit the offer's visibility to customers.

a home fireplace, we sell the comfort of the fireplace and the services and products that make it a pleasure to use. This difference will be built on the ability that businesses of the 21st century will have to put on a show, to create a scenario around a service or product. The press already understands this method and writes titles or modifies photographs to accent the dramatic side of news.

There's nothing really revolutionary about it, lots of communication and advertising come from the search for friendly attitudes or the complicity of the customer or future customer. No one is really fooled by all of this playacting. The psychological values that stick to a product come from its intrinsic qualities and the service it truly offers to society, a specific group of individuals or companies. Tomorrow's company, like society, will be based more on relationships than on functions. It will put its products and services onstage to gain in emotional communication as well as in practice…to sell more. The product catalog on paper or on a website will have to be completed by the scenario of their users, their creations, their productions. From now on we will also differentiate products and services by giving them a scenic dimension that globalizes the service offered to the society.

It's easy to understand the difference. One supplier puts an accent on a functional characteristic of the document chain, another who is trying to find a way to make his service more appealing by associating it with a value of connivance, will say that he contributes to the preservation of the company's memory, a situation that he will stage in his communication. The first one will sell alarms, the second protection and will show his customer how he avoided an unfortunate misadventure.

Big communications consultants, top advertising agencies feel the evolution that we see taking stronger hold in messages directed to consumers. When Business Lab asked internauts to send their pictures in to illustrate office life for a French telecom operator, it invented advertisement where the internaut is the hero. The contamination effect worked: the operator invited each internaut that was kept to tell friends, through a reserved message board, about the adventure that was being put up by Business Lab on the customer's site; this all lead to a useful address file for the operator.

More and more product and service messages put their products on stage , take the example of Nescafe. But what is newer is to see the company itself put on stage. Yesterday they were very modest and invisible, company directors have to accept to create heroes and heroines that will attract a friendly attitude from people who share the same emotions, the same values in virtual communities[203]. It's no longer a quarter of Tokyo who is the star, it's the business.

Cognitive behavioral studies have been carried out and they show that it's emotional content that draws the attention of a reader or a website visitor. The presentation of services or products will, according to the circumstances and the target objectives, favor "cold" or "hot" vectors in order to create an emotion. Nicolas Gaume, the French founding president for the Web game company, Kalisto, speaks about market expectations to form "emotional communities" for virtual tribes looking for new and shared sensations. Those who understand quicker than others the importance of the development factor in neteconomy will become famous and will have the ability to use differentiation that is specific to intangible economy: a strong image to drive their products.

203In France, Afflelou does this with his ads for eyeglasses or, Richard Branson, the owner of Virgin, when he launched himself on a world balloon tour.

4.4. Adapting your offer to the "customer-facing" economy

Available time can not be cut down. We sometimes don't even have enough time to read all of the magazines that we buy, nor consult the grouped notes that are written by the company's collaborators, not to mention all of the received e-mail. In the century of electronic networks, of crazy zapping (quick changes in centers of interest that's specific to the cybereconomy population), and of self-commutation (changes in permanent participants), the average individual is affected by a decrease in his ability to concentrate and his attention span[204]. Specialists in electronic business are working on ways to recover part of the lost attention for their benefit, and a science is in the process of being organized[205].

When we talk about the acceleration of cycles, it's generally associated with material flow, and sometimes with the obsolescence of information; from now on we can add the acceleration of zapping, the amount of time an individual will pay attention to any given activity. The amount of choices is constantly increasing, making it possible to access more and more products and services, all more appealing than the others, but they have to take into account the notion of a time limit necessary for getting information, buying and consuming. The attention span is dramatically decreasing; the ability to attract and capture attention is a major asset for on-line business. In the eighties, teachers in business schools told their students, "You have one minute to attract and hold your customer's attention." Today they say, "You have eight seconds."

In a society of hyper-choices, potential customers are either blasé or paralyzed with indecision, each new situation takes up only a few seconds. So the only way to cope with the smaller launch window and still hit the target, is to increase and expand the line of goods and services offered to the potential customer. Then, like a bashful lover, invent all kinds of chance meetings; another reason to dare to step out of the traditional routine of house services. The 21st century business will associate with others in order to expand and increase its chances of capturing the attention of future customers. We don't sell train tickets anymore, only week-ends in Venice.

Each business transaction is an occasion to know the customer and to improve the relationship salesperson/customer. At the time being, technocrats have learned that tracing allows follow-up for identified customers every time they carry out a transaction (for example sending a check). Now financial organizations can create a strong relationship with their customers with the development of electronic money and credit cards.

It's futile to use technology to foster special relationships with customers if it's done with the intention to automate everything. "Relationship marketing" runs the risk of remaining a product for technocrats if it makes companies rely on the databases made up by their marketing and trade departments. We know that coupon operations are a lost cause because flyer distribution isn't reliable enough. And all readers know that on this basis, there is not only very little reliability but practically no durability for the operation. Coupons have become an inside joke for specialists. The development of customer loyalty really depends on

204See Denis Ettighoffer and Gérard Blanc, Le Syndrome de Chronos, du mal travailler au mal vivre, Paris, Dunod, 1998.

205Thomas H. Davenport, School of Management, Boston University and director at Arthur Andersen Consulting, has just written a long paper on this theme in "l'Art du management de l'information du quotidien", Les Echos.

clear policies and a general attitude of service that, we have to admit, is much more developed in the US than in Europe. When Wal-Mart came to Germany, it opened the eyes of the national superstores, who had to change some of their habits. Many companies who have placed their hopes in telemarketing techniques may well be limited in their operations as individuals demand privacy protection[206]. Here again, the customer will decide if he can be approached or not.

The only sensible thing to do will be to make every contact with the customer a satisfying moment and then do your best to multiply the occasions for contact, making them pleasurable moments for the customer. To sum it up, technology shouldn't only be used to get to know customers, it should be used to serve them and make contacts an enjoyable moment to keep the customers and develop their loyalty. There's nothing new under the sun.

4.5. Anticipating "crash management" in an unstable environment

The beginning of this new millennium is the end of an era where the director and his executives were the center of a company, they were the pilots with more or less talent for the job. Today, in order to optimize management of necessary resources and the running of the business, to better coordinate complex groups that make up interdependent organizations, we need to increase the number of management tools and "repairmen for the complicated". Computers and computer scientists settle into companies. There is still a pilot in the plane, but his controls are progressively becoming automatic. The "computer fairy" makes order out of the complex, but the "bad genie", the technocrat, is there to make things complicated…That's why computer applications daily enlarge their field of intervention. Gigantic software tries to make a model out of all of the company's activities. It creates systems that are so complicated and so structured, that they wear the company's life like a boot that doesn't fit.

Since the sixties, the analytical structuring and modeling of business management, intended to make industrial and commercial organizations more efficient, has shown much greater positive effects than empirical ways of approaching the problem. Today, the sophistication of computer modeling gives an unquestionable advantage for helping organizational piloting. However, this assistance for organizational piloting has its limits, just like the assistance for cars drivers, plane pilots and industrial *processes* have their limits.

Machine-rule shouldn't lose sight that organization is an art, an art that tries to reduce the apparent chaotic character of a group without ever being able to avoid it from coming. Nevertheless, instead of learning to live and work in a world of uncertainty, traps and opportunities, we reassure ourselves by computerizing our company. The methodical formalities associated with the so-called powerful models created by computer tools, have really built an illusive universe for business managers.

First of all, interactions with reality will crumble. There are many who, afraid of human relationships or of the reality out in the field, hide themselves behind analysis and they overuse tools for electronic intermediation. They increase the number of robots and other machines, because they just don't understand that company virtualization doesn't mean management virtualization. Management has to keep in touch with the real field unless it

206Like the recent complaints against Double-Click.com, a US on-line telemarketing and teleadvertising company.

wants to jeopardize the company. When a manager uses pilot assistance for his business, he only gets a reflection of past reality. It's either fragmented summaries of reality, or very detailed data that only describes the complexity of a finished reality from the past. The assistance can't give any clear direction for decision-making in a changing, unstable environment. Furthermore, even though it is very useful to help understand the underlying structure of events and their possible consequences, systemic modeling remains a highly technical science, hermetically closed to the majority of managers, thus rarely used in daily affairs.

Secondly, modeling that favors understanding, at the risk of reducing the degree of interpretation, is dependent on the reliability of its sensors, people who process information that's sometimes already incorporated. This work has a cost. If a trouble-making factor, foreign to the model, comes into the game, everything falls to pieces. And as we've already observed, meta organizations include many outside participants. In fact, it's for this reason that many companies refuse the virtual organization approach: they don't trust players from outside of their "jurisdiction"…It's not hard to understand their reaction: the number of accidents, security system failures or events that seriously affect computer systems keeps on growing. Specialists fear more and more that there will be a big crash in today's network economies and don't hesitate to call it an "electronic Pearl Harbor". Every business, and especially virtual businesses, who will fight each other through electronic networks, constantly run the risk of a systemic crash glaring in their face[207]. Finally people are starting to realize that industrial and computer malfunctions can have disastrous consequences for the environment and the losses are tremendous, legal expenses, high insurance payments, material destruction. All this has lead to a growing importance of danger sciences, also called *risk management.*

In general, these concerns have had positive effects for better risk anticipation in companies, and also a drop in insurance coverage costs. Insurance companies are often the first ones in line to open their customer's eyes to possible problems. At first, the danger sciences for *risk management* concentrated on in-house risk factors or behavior that could cause danger from the inside of a company. But in a more and more interdependent world, risk factors and behavior coming from outside of an organization are becoming more likely. In other words, even the most cautious attitude can't prevent an accident caused by a third party. Seen in this way, *crash management* will have to react to an exogenous event, difficult to predict, that could have harmful repercussions for the company.

The problem isn't just to know if it's possible to reduce some of the uncertainties but to know what the plan of action is in case of an accident, in case of *crash management*! A good example of this is the shipwreck of the oil tanker, the Erika, off the French coast. It wasn't sufficient to reinforce tankers with a double hull, because when the accident happened, the coastal countries were caught completely by surprise, with nothing: no adapted material, techniques or methods had been prepared in advance to act quickly and efficiently in case of

207The businesses Yahoo, E.bay and Amazon.com were victims of an attack that shows the systemic risk that businesses run when they don't anticipate or prepare for the possibility of an accident.

an accident. In systemic organizations you just can't predict and reduce all risks that could upset an entire chain of people involved. *Crash management* upholds the idea that beyond risk anticipation, we have to know what to do in case of an accident. Recent history abounds with examples of companies who, often because of pride, were incapable of preparing for the worst situations with an arsenal of scenarios and measures to take in case of an accident.

A large-scale systemic problem can no longer be dismissed in a meta organization. However, if we prepare in advance for difficulties or situations of *crash management*, it might be a way of avoiding or at least of limiting the dramatic consequences that they might bring. It's not a question of simply building a database but a question of working together to build a base of case studies for real or possible situations that many partners or collaborators might be faced with out in the field of work. The consequences of the Y2K bug on computer applications or a breakdown in a systemic chain because it was attacked by hackers gives quite a worrisome look at what may be waiting for meta organizations in the future.

An experience base, a tool for *knowledge management* (or KM) dedicated to *crash management*, isn't justified by the law of growing profits but by the law of decreasing problems that justifies the positive repercussions. This base will be used to identify weak signals, to look closer at cumulated know-how and also to imagine how to face unexpected operational situations. That's a circle of activity that is hardly used yet, where companies come for help, like Inference; the circle of activity develops applications such as help desks by making a correlation between problems that most participants have had. It's a kind of FAQ (Frequently Asked Questions) for common problems for the concerned industries.

Events remain unpredictable but chance is predictable. In a meta organization, new and troublesome factors are compounded, accentuating the unpredictability of situations that managers usually face. Scientists are interested in chaos because they wonder what role it plays in the evolution of the species. Research on small animal behavior in the face of danger come to an interesting conclusion: if we can find predictable values, we won't have chaotic reactions but predictable ones. If the animal, like any organization, is predictable, the danger is at a maximum for him. Said differently, strategically, if you are predictable…A problem that is well known by military strategists. The predictable enemy is a dead enemy. Furthermore, that which is predictable can be modeled. A computer network can then take over the running of the model, even if it looks complex. The difficult thing to do is to know in advance what decisions to take in just a few seconds because we have anticipated the situation, like in the stock market, the maximum of scenarios of *crash management* while minimizing, since we can't avoid them, the consequences of a high systemic integration in any meta organization.

The answer to this unpredictability does not come under daily management, taken over by the automatic or assisted piloting of the organization, but directors and executives should keep unpredictability and chance under their direct control. As Machiavelli wrote so long ago, "If fortune is the arbiter for one-half of our actions…", let's at least know how to keep our half rather than hand it over, a little too quickly, to computers.

VI. CONCLUSIONS: ARE WE READY TO COMPETE THROUGH THE USE OF ORGANIZATIONAL MODELS?

"When the winds of change blow
some build wind breaks,

Others build wind mills…"
A Chinese Proverb

As information and communication technology spreads at lightning speed, it's changing global society, its organizations and the terms for international economic exchange. In order to develop their businesses, companies interconnect more and more with many different partners. The race is on as parties sharing common interests unite to invent models of economic organizations, freeing themselves from national constraints. These meta-organizations will be a source of both wealth and problems for the different nations involved and also an important model for companies that need to adapt to today's intangible economy, represented by electronic networks.

Worldwide creativity is at work to radically renew economic organizations. All kinds of companies are adapting to the network century for their own benefit. It's a definite advantage and a leverage tool for development. Today competition is especially tight between the different organizational models.

Companies everywhere are downsizing their staff and line units by reinforcing their ability to work together. John Kay[208], a consultant and economics professor at the London School of Business, compares the economy of scale made from a technological point of view to the lack of economy from a human standpoint. Like us, he's convinced that the ability to get people to work together is more important than industrial processes. According to him, the prospect of opening new markets is what motivates mergers, and they don't take into account the human aspect of economy. Even worse, the restructuring costs penalize a good return on investments and weaken the results. John Kay reminds us that competitive benefits are out in the field, not in general headquarters. It's only through size cuts and the development of small organizations, living in symbiosis with the local fabric, that companies will be able to survive in the market of the 21st century.

However, his analysis of the situation doesn't mention the need to question all traditional organizations. With no more boundaries, we stand up for the idea of virtual organizations that include all of the players in a given branch of the economy. If the company of the future is a co-company, we are no longer talking about small or big companies but about clusters or

208John Kay, Fondements des performances des entreprises, Oxford University. Press 1995 (UK) and Hardcover

different sized networks: meta organizations that are more or less important and structured. After decades of keeping to itself, the company of the future will be a chain of closely collaborating organizations which will include poles of ability, channels of technical innovations, commercial networks and customer communities: all of this in huge electronic networks.

Society has to stop considering the phenomenon as a passing fad in countries and businesses. And certainly, the problem should not be left to technicians to deal with alone. The Merrill Lynch Forum recently studied the problem and the results are very telling. When asked the question: "Do NICTs make your life easier or more complicated?" 46% of the specialists answered that their life was more complicated against only 38% of the general public.[209] The technological crisis is above all in their minds. Even though we don't stop talking about the amazing progress in technology, we seriously suffer from a lack of thought concerning organizations for the future. When this becomes a national problem, it's time to worry. The risk gets bigger and bigger and it could destroy our economy, depending on what kind of organization models we are subjected to: creative or destructive for employment.

This behavior, influenced more by ideology and culture than by technology and economy, slows down the discovery of new forms of organizations adapted to our era and can even stop the economical development in a given region. Deep-rooted cultural reflexes constantly keep us dodging the realistic economical vision of the world that from Africa to Asia will completely change the global capital flow within the next ten years. A simple telephone wire is all that's needed to enter the cyberspace of business in Net communities. Since 1980, the number of telephone lines installed worldwide each year is more than the total of all preceding years.[210] All countries understand the important role that telecommunications play in lasting economic development. The companies then put pressure on their country to be connected to Internet. Soon electronic business transactions and trade coming from the Orient and Asia will surpass those coming from Europe. These countries' products will be specially elaborated for direct sales with the help of regional platforms, virtual industrial districts adapted to the language and the customs of the consumers.

Companies in some countries remain minimalist while others believe that access to technology is essential for their economy. The Asian and Anglo-Saxon press talks about technological strength as an example of a new power struggle between different parts of the world. Korea, Taiwan and Singapore have no qualms in tackling advanced technology such as telecommunications, software, aerospace and robotics. Young countries invest in these technologies in order to speed up their entry into the cyber-economy. In particular, they use modern organizations: new virtual business models that are generally economical in energy resources.

209C. Leroy, Le Monde Informatique, March 1997

210Perspectives de télécommunications, OECD 1997 (the OECD zone covers 68% of total lines for a population of 17.5% of the world's population).

1. Lost in systems analysis, man is still the inventor of organizations.

During the 20th century, the work relationship between men and machines has always been depicted as a quasi-romantic conflict, face to face, with man and robot staring eye to eye. On May 11, 1997, Gary Gasparov lost a chess game to Deep Blue. This date symbolically marked the domination of machine over human. People forget though, that it was thanks to hundreds of players' games that Deep Blue was programmed in the same way that the experience of hundreds of men allowed the creation of "inforganizational" components. This defeat upsets our common sense and our image of the human brain dominating artificial intelligence. It's an anthropomorphic reflex, we imagine an android in the image of man and at the same time his rival. Nothing could be less true, man is too complex and too fragile for a robot (supposing that it has intelligence) to "want" to imitate him. More commonly, there is a rivalry human vs. systems that develops. In the final victory, wherever "hard" science can be used, machine systems come out winners.

"Virtuality is an amplifier for intelligence," affirms Howard Rheingold,[211] who regards interface as a new symbiosis between human and machine. This is well illustrated by the sailor who single-handedly won a race. He was asked if it wasn't thanks to his computer that he had won and his answer was, "I don't know if I would have won without the computer. But I'm sure that without me, the computer wouldn't have won!" Machines need men just like men need machines: score one point for all, and start over again. The relationship human-machine first develops on the level of "convenience" with computer assisted measurements, calculations, simulations and analysis: billions of pieces of information are available. But it's man who imagines the applications for the computers and who puts interdisciplinary communities into motion to create links, relationships and combinations that will not be detected by the most powerful machines. Why? Because machines don't have desires!

Soft science takes its revenge on hard science because it escapes the rationality of numbers and leaves humans the possibility and the right to organize themselves differently, not necessarily according to the relentless order demanded by hyper-productivity. Imagination is still in command and people still pilot, thanks to information technology, and the future can be imagined and transformed with the help of a tremendous virtual power. They won't do without it. NICTs are part of the innovations that play an economical and social role. That's why the modern manager has to change his managerial logic: at the same time as NICTs' applications develop in society, a society of relation and desire establishes itself. The thrust of computer science, as we said before while discussing the spread of technology, only follows the growing demand for quality relationships in all levels of the population.

Today's leaders have to select from hard and soft organizations, from number sciences and social sciences, from flexibility and maximum productivity, from company performance and quality of the workplace, from product quality and customer's wishes. The terms for trading have not changed, but the organizations have changed and force us to collaborate to try to reconcile all of the parameters.

211American journalist, author of La Réalité virtuelle, Paris, Dunod, 1993

The paradox is that people are still the troublemakers, they are the vectors for the transformation of systems that can only optimize their functions without ever changing themselves. Imagination gives important power in that organizations will be changed into *plug and play* bricks that will interconnect with others. The company of the future will be made from "inforganizational" components that, when put together, will make a working chain , with infinite combinations to allow it to adapt to specific economic models and sometimes short-lived markets.

2. Better organized countries will attract creators of wealth..

In a virtual global space, countries have become actors in micro-economics. Turnovers for big international groups are higher than the yearly GDP for a majority of nations. Daily international financial transfers go way beyond their ability to intervene. Although they may continue to have some control over their citizens and, in a small way over their domestic market, their influence on international markets becomes insignificant. Regional high-tech centers with a concentration of gray matter have more chances to take the initiative and to influence people than "kingly countries" do. The latter can still be a nuisance…by failing to act.

That's why international groups, in more or less hidden ways, relocate their main offices and their intellectuals in places where they find operational benefits. On the other hand, the leaders of these nations who are losing their companies because of excessive fiscal pressure, do not tell the citizens that the living wealth is leaving the country[212]…In general, these companies are far from thinking about the long term effect that the lack of competitiveness will have on a lasting development. They've never questioned the structure of their own economic model. Faced with these new problems, the danger no longer comes from the nation's inability to maintain kingly legitimacy. Now the problem is the inability to encourage organizational inventiveness necessary for change, because there has never been any thought or debate about the problem. Faced with international competition, the success of these national companies depends on the ability to change. There is a legal notion known under the term "loss of luck" that describes the situation of these companies, unable to change. It is, remember, the first cause for the expatriation of added value.

It is plain to see that in all parts of the world, the failure to adapt organizations to the wagers of the 21st century and the lack of a project for major organizational renovation, lead to a "loss of luck" for companies in the flood of competitors who have come to confront each other in the biggest world markets. How long will it take leaders to realize that competition between organizational models is as important as running a political economy? We don't know the answer to this question, but we know that it's worth millions of jobs.

From now on, let's not worry that our organizations never stop changing but that there is danger if they don't change enough.

212In 1999, 164 of the 500 biggest Swedish companies were located abroad and 50% of the market capitalization for the top twenty companies quoted on the stock exchange in Stockholm were abroad also. Enjeux Les Echos, November 1999.