

***E*LECTRONIC COMMERCE**

FEBRUARY 1999

CIGREF

Cigref, the Information Technology Club for large French corporations, has been in existence since 1970. Its purpose is to promote information systems as enterprise value creators. It provides a premium forum for the managers of large French or European corporations to meet and exchange information between users of large information systems. By sharing experiences, best practice can emerge. Each year, Cigref carries out studies on subjects of common interest.

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FOREWORD

It is worth getting involved in electronic commerce, since business drives enterprises and electronics is the underlying technology of our age.

But how does one get into it? How fast? Where do you start?

There are examples available, especially for the French scene. Train ticket buying through Minitel has been a success, as have mail-order sales, and EDI enables effective transactions between businesses.

But the whole world is now turning towards the Internet and the question now seems to be "*how can trading be carried out on the Internet?*"

Once again, there are number of examples that suggest successful strategies. Dell, for example, sells USD 3 billion (and growing fast) of PCs a year on the Internet, Cisco handles most of its distribution relations via the Internet and Degriftour offers last-minute travel flights both via Minitel and the Internet.

But is the way ahead quite so obvious? Unfortunately not. Our task force has tried to give a few practical guidelines to help each member decide on their own approach.

The first task was to analyze the various types of electronic commerce, which is increasingly moving towards mainstream B-to-B and B-to-C. This effort at rationalizing the data is largely due to the tenacity of Olivier Porte, the project manager and Cigref research officer.

The second task was to identify the triggering factors that would activate the "electronic commerce" process. First and foremost among them is General Management's involvement. Setting up an e-commerce process means rethinking the way the enterprise works, especially with respect to its clients. There must be a clear focus on the services they receive, independently of the intermediaries who deliver these products and services. This means a Business Reengineering approach which impacts the existing organization of the enterprise and hence requires the support of General Management.

The third key task is to prepare the environment for electronic commerce. The euro appears to be one accelerator, but what about electronic payment methods in Europe?

French banks have recently agreed on setting up a single e-payment system compliant with the international standard. This is certainly a step forward. But for the moment, there is nothing similar at European level, where there is a variety of different tax schemes and encryption procedures. All these issues have been emphasized in the report that

Francis Lorentz delivered to the French Ministry for Industry and Finance in January 98; but the same report shows that many of the answers are still missing.

Most large corporations are in fact ready to start electronic commerce. The enormous effort they have made recently to equip themselves with PCs and use intranets as the core of corporate information systems has enabled them to quickly set up electronic links with clients and suppliers via the Internet.

At the same time, telecommunication carriers have tried hard to push enterprises towards electronic commerce, while trying of course to cream off telecommunication revenue streams generated by the resulting trading transactions.

There is naturally acute suspicion about the lack of Internet security, but this will gradually diminish as ad hoc technical solutions are rolled out. The real issue at the moment seems to be whether one should launch into this new dimension. Some believe you should jump right in, since it represents the whole shape of business in the 21st century, while others consider it a still immature technology. There is also plenty else to do for the shift to the euro and Y2000...

Our group opts strongly for the first scenario.

It is now up to our readers to judge — and act on it!

Jacques Beer-Gabel
CIO, Rhône-Poulenc

PARTICIPANTS

A task force led by Jacques Beer-Gabel, Chief Information Officer for Rhône-Poulenc, was set up within Cigref, with the active participation of the following people and corporations:

Ulrik Bergsten	Crédit Lyonnais	Marc Grezes-Rueff	BNP
Martine Blanchet	Elf Aquitaine	Pierre-Antoine Grislain	Total
Francis Blois	Usinor	Michel Guenard	Danone
Éric Bolle	Rhodia	Richard Hababou	Société Générale
Jérôme Bruneau	Mutuelles du Mans	Bernard Jeanneau	Usinor
Bernard Buisnière	AGF-SI	Monique Kayser	PSA Peugeot Citroën
Brigitte Candebat	CNAM-TS	Antoine de Kerviler	Air France
Pierre Chabirand	SNCF	Marie-Gabrielle Lachat	Mairie de Paris
Jean-Marie Charpentier	BNP	Philippe Lanson	Renault
Jacques Chatelon	Bolloré	Jocelyne Le Magnen	EDF-GDF
Georges Ciotti	SMABTP	Bruno Leoni	Azur GMF
Philippe Clermont	Informatique CDC	Michel Lié	Air France
Jean-Marie Collange	Crédit Lyonnais	Ivan Massonnat	Paribas
Bruno Couppey	Macif	Marie-Claude Mazet	MGEN
Philippe Cueille	CNAM-TS	Jean-Marc Mirailles	La Poste
Anne Daire	CCBP	Vincent de Palma	CCF
Olivier Delaveau	CNAM-TS	Alain Monroche	Rhône-Poulenc
Yannick Delsahut	Informatique CdC	Thierry Parard	MGEN
Robert Demory	La Poste	Jean-François Peironnenche	CNAM-TS
Bruno Donat	Air France	Stéphane Rabany	Bolloré
Hubert Evrard	Renault	Jean-Sébastien Rembert	CCBP
Valéry Fassiaux	Crédit Lyonnais	Marcel Richard	Société Générale
Pascal Febvre	Azur GMF	Gilles Tréhin	Matif SA
Didier Galland	BNP	Jean-François Vallat	SNCF
Christian Gaujac	Sanofi	Christian Voisard	Gan
Philippe Geffard	Axa	Yann Xoual	Commercial Union
Axel de Gendre	Air France	Philippe Zanini	Mairie de Paris
Ronan Gilbert	Société Générale		
Bruno Grelaud	BNP		

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1 INTRODUCTION

1.1 What this study covers

This study is not another survey of the state of the art of electronic commerce and does not claim comprehensive coverage of the question. On the contrary, we believe our readers have the right to ask questions such as:

- Can I escape from the feeling of suffocation induced by swallowing a huge dose of information about electronic commerce?
- Should I know how to factor electronic commerce into my business strategy?

Each reader must make up their own mind.

At this point, it is still too early to answer positively, but we believe it is important to provide a few ideas for those who share such doubts. In both form and substance, the four following sections attempt to provide the essentials for anyone trying to make up their own mind about e-commerce in light of their own situation:

- The section “[IT WAS BOUND TO HAPPEN](#)” reviews what is at stake in electronic commerce and by drawing on the results of respected analysts, tries to trace some realistic guidelines.
- The section “[BRIEF USER’S GUIDE FOR DECISION MAKERS](#)” looks at the lessons to be learnt from the main success stories so far in electronic commerce, and tries to emphasize the key factors that drive success in electronic commerce, together with the main risks they entail.
- The section “[HOW TO PREPARE YOUR BUSINESS](#)” lists the key technologies for maximizing the impact of electronic commerce on a large corporation as well as on its surrounding supply and customer network. But it also emphasizes organizational aspects and the process re-engineering required to integrate electronic commerce effectively.
- Lastly the section “[POSSIBLE DEVELOPMENTS](#)” analyses the political and economic environment and offers three possible development tracks. It shows that each track will first be influenced by player strategies, mostly collective but sometimes individual, in those cases where such dominant players can influence the market.

Once again, there is a near infinite number of possibilities, and these player strategies may largely go beyond the limits set by this study, especially with respect to technology paradigm shifts which cannot as yet be foreseen today.

But before going any further, let us return for a moment to the origins and initial goals of Cigref's "electronic commerce" task force.

1.2 Cigref's aims

This is not a new field, but the Internet has completely changed it.

Electronic commerce already exists in large French corporations in the form of Minitel services, toll-free numbers and EDI, and has recently scaled up with the emergence of the Internet and Extranets. Information Systems Divisions (ISDs) have a major role to play in taking this phenomenon on board.

Against this background, Cigref set up a task force with a very broad agenda so that everyone would get a hearing on the three fundamental aspects of electronic commerce:

- The economic aspect
 - developments in the organization of trading,
 - methods of carrying out transactions,
 - impact on intermediation and the value chain,
 - shopping malls and one-stop shops,
 - “one to one” marketing and customer retention
- The political and regulatory aspects
 - local challenges for a global agenda,
 - reformulation of the legislative and regulatory framework, especially encryption theory,
 - upgrading of infrastructure and dealing with the “Minitel situation”
- The technology and “business” aspects
 - analysis of the market for electronic commerce on the Internet,
 - prospects for re-engineering Business Relations,
 - opportunities for ISD contributions,
 - involvement of general management divisions and operational divisions,
 - the true/false debate on security.

This study is designed for all those whose corporate responsibilities involve evaluating the opportunities opened up by electronic commerce; it is not just simply another overview of the subject. Readers may wish to read this report in any order and manner they like: a straight line is not always the shortest way to your goal.

And it is worth remembering a proverb that is almost custom-made for electronic commerce: “God helps those who help themselves.”

2 IT WAS BOUND TO HAPPEN

2.1 Definition / What's at stake

Three electronic media
for three different
“business models.”

There is so much news hype about electronic commerce that there are more articles written per day than any reasonably robust human being could read in 24 hours. But it is still worth looking at a number of constants:

- Electronic commerce can be defined as “the utilization of electronic media to carry out transactions or business relations between legal entities and individuals.”
- The Internet, Minitel (in France) and Electronic Data Interchange (EDI) applications are the three most widely-used media for electronic commerce today.
- For historical reasons, we do not consider the telephone as an “electronic media” and it will not be examined in this study. Interested readers can refer to Cigref’s report on “Call Centers” (September 1998) which covers a number of telephone-enabled commercial applications. Telephone-based sales flows are examined in section 4.4.
- There are three main types of legal entities and individuals in the electronic commerce chain: businesses, consumers (individuals) and governments (usually including public services). This leads to three categories of services:
 - business-to-business commerce,
 - mass market commerce (businesses - consumers),
 - administration – business relations (whether or not commercial).
- This typology is cross-cut by a grid of functions. This second level of mapping brings out a number of major services families, from the (supposedly) simplest to the most complicated:
 - promotional and advertising services,
 - electronic catalogues,
 - after-sales services,
 - subscriber services,
 - national transactional services (including ordering goods and services),
 - international transactional services,
 - transactional services with goods tracking,
 - production-integrated transactional services.

In the same way, a number of long term trends can be highlighted in studies from the major analysts on the size for the electronic commerce market segments...and the results vary enormously:

IDC, one of the most regular publishers of market surveys on the subject, has given the following forecasts for 1996-2001:

	1996	1997	1998	1999	2000	2001
Business-to-business market *	0.2	0.65	1.7	4.15	8.4	14.15
Growth rate		+221%	+161%	+141%	+102%	+69%
Mass market	0.15	0.4	1.25	3	6.2	10.7
Growth rate		+209%	+198%	+145%	+108%	+71%
MARKET TOTAL	0.35	1.05	2.95	7.15	14.6	24.85
Growth rate		+216%	+176%	+143%	+105%	+70%

* exc. EDI

Growth of the market for electronic commerce across European Union (in US\$ bn).

In light of these figures, around the year 2001 electronic commerce should have a share of between 1 and 2% of the retail trade, i.e., far less than mail order sales, worth around 3% in the European Union.

As these figures show, the business-to-business / mass market ratio will remain stable throughout the period at 60/40. Other reports have come up with different figures:

For example, in May 1998, the Gartner Group published the results of a poll carried out with Dataquest of 300 Information System Managers for major European corporations. It showed that the differences between B-to-B and mass market electronic commerce will gradually disappear, due to the use of a public key encryption infrastructure and greater electronic utilization of wage-owner "Purchasing Cards."

With respect to the B-to-C market, Dataquest has underscored the enduring divergences between local European models. There is no emerging "business model," whether the revenue stream comes from production, or from advertising. The only sure trend is the emergence of a clear separation between container and content.

One clear phenomenon: the separation between container and content.

Lastly, in spring 1998 the European research center of the US consultancy Forrester Research published another study showing that the growth of electronic commerce in Europe is closely tied to advances in Internet penetration rates across different countries.

The European Internet surfer population should rise from 17 million today to 53 million in 2001 (home, school and work combined), a global penetration rate of 13% compared with an estimated Internet penetration rate in the USA of 34% for the same date.

This said, online shopping will not take off as fast in Europe as suppliers would wish.

The two niches of retail trade and content commerce are therefore likely to develop at a measured pace. Income from retail trade should be no higher than FRF 25 billion (EUR 3.8 bn) in 2001 for Europe, and the content market FRF 15 billion (EUR 2.3 bn). For the same date, Forrester forecasts retail trade in the USA worth FRF 100 billion (EUR 15.2 bn) and over FRF 35 billion (EUR 5.3 bn) for content. In Europe, 25% websurfers will be regular online consumers in 2001. Their annual spend will be FRF 2,000 (EUR 305).

<i>SALES (US\$ millions per year)</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>
Business trading	879	7208	19285	56713
Retail trade	165	372	1296	4568
Content	124	335	966	3081
Total	1168	7915	21547	64362

Estimated turnover in Europe (US\$ millions per year).

The single bright spot is business-to-business electronic commerce. European businesses will be the first to gain from the high PC penetration rate in businesses, the launch of the Euro, and their resolve to sustain penetration rates on national and European markets.

Forrester also forecasts that the major European markets will in due course reproduce the relative size of national GDPs. This is good news for France, which should be able to benefit from an equipment base worthy of its industrial capacity.

<i>SALES / COUNTRIES (US\$ millions per year)</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>
Germany	234	1662	4956	16090
United Kingdom	257	1741	4525	12872
France	58	514	2155	8367
Scandinavia	152	1029	2370	6436
Rest of Europe	467	2968	7541	20595
Total	1168	7914	21547	64360

National turnovers (US\$ millions per year).

In conclusion, Forrester Research gives four tips for businesses developing electronic commerce. They will make a number of French people smile when they think back to the dreaded 3615 (Minitel access) syndrome in French corporations a few years ago:

- Retail sales: address consumers in their offices. This creates a novel partnership chain (e.g. virtual groceries on large corporation intranets)
- Help users pay for access.
- Business-to-business trading: bringing together scattered users and creating sectoral “online” communities.
- Integrate online sales into existing distribution channels such as Call Centers or indirect distribution network.

2.2 Beyond perplexity

In many European countries, this rich literature has been received with polite indifference by most major economic players, for several reasons:

- the overkill of apparent technology innovations, and the absence of recognized standards;
- lack of credibility due to the rapid publication of market forecasts whose figures for market growth vary in a proportion of one to ten;
- the focusing of resources on highly consumer-oriented projects such as the switch to the Euro or year 2000;
- a certain trend until mid-1997 of prioritizing investments for improving productivity rather than gaining market share;
- lack of enthusiasm among institutional players about infrastructure, including clear tax rules, suitable security procedures and cheap telecom.

To these Europe-wide factors can be added the unique French experience of electronic commerce by Minitel. This factor has often been explained to US product managers straight off their transatlantic flights, but they simply can't understand why their superb demonstration of a new system for home banking, garden furniture ordering or train ticket reservation turned out to be a flop in France, even though it generated enthusiasm elsewhere...

However, most serious studies carried out in recent months show that over and above the bountiful forecasts (always for 5 years, so that the target market identified for 2001 in studies published in 1996 is now 2003...), electronic commerce is gradually finding a place in business investment strategies. Even more important, leaders in this field (currently American) have since 1996 been implementing the structures that are already producing a significant volume of business in electronic

commerce, i.e. over one billion dollars, which gives a foretaste of possible sustainable growth in this new way of doing business.

It is also important to note that information systems stand at the heart of a number of major success stories, and are being given close attention by General Management. Let's look at two revealing examples: Dell and Degriktour.

First **Dell**. This Texas-based PC maker had long been an outsider in a market dominated by half a dozen major brands. But very early on, Dell opted for electronic commerce to differentiate itself and broaden its market, first towards the mass market, then towards businesses. This attitude judged as opportunistic by some (but a good strategy always has a dash of opportunism, surely) emerged from the vision of its founding president Michael Dell, who in 1996 gave the necessary drive to reorganize his business, so that a prospect or customer processed via electronic commerce would benefit from the same services and information as prospects and customers processed by other distribution channels.

As a result, Dell generates by mid 1998 more than US\$ 3 million in online sales per day (and the notion of working day is expanding by the minute) and hopes to generate 50% of his sales in 2001 by electronic commerce.

More specifically, Dell generated US\$ 1 billion in Web sales in 1997 out of a total of 5.6 billion, and in 1998 aims to generate US\$ 2.7 bn sales via the Web out of a total of 7.8 billion. In other words, 80% of the increase in Dell sales in 1998 should come from Web-based sales!

As for Dell Europe, it intends to make 10% of its sales via the Internet this year. Out of a forecast US\$ 2.04 bn in European sales for 1998, Europe's fifth largest computer maker will sell US\$ 229 million on line.

To achieve this, Dell is working flat out: it has just announced that its European production capacity based in Ireland is to be doubled. The investment agreed for purchasing a second production unit in Limerick stands at US\$ 250 million. This gearing-up also includes Internet innovations: Dell is also to test the *OBI (Open Buying over the Internet)* standard with a restricted set of customers.

But for Dell, 1998 is the year when it deployed new merchandising software on its 18 regional Web sites. This involves equipping several thousand sites belonging to Dell's European professional customers (90% of its sales) with new customizable functionalities. Today large accounts can configure and manage their computing over several countries from Dell's Web site (self diagnostics, maintenance labels, etc). This means that Dell can operate with less than ten days of products in stock.

For Dell, as with Dégriftour, the inspiration came from top management.

Under such conditions, it is hardly surprising that Michael Dell, the founding President, is himself known as the most demanding user of Dell product online sales services, and as the person who makes most suggestions for improving it.

Dell is not alone: **Dégriftour**, the leading French supplier of Minitel-based travel, has also wagered on electronic commerce via the Internet to boost sales.

Once again, the initial impetus came from the top. The firm's Managing Director Pierre Alzon was convinced that it was extremely risky for his Minitel sales to stay on the sidelines of the Internet movement, and that the price of the entry ticket was still affordable. Internet-based sales started in 1997, and by mid 1998 represents 15% of Dégriftour's sales, after requiring a complete re-organization of the information system both in the front-office and the back-office. The service is targeting 50% of sales by 2000 at the latest.

At this point, it is worth laying to rest two rather "comfortable" but wrong-headed ideas:

- France can wait and see, since it already does more electronic commerce by Minitel than almost any other country has managed to produce on the Internet.
- Internet-based electronic commerce can evolve seamlessly out of past practice.

The "Minitel case"

For someone arriving from another planet, we could summarize France's unique experience of Minitel over the past 15 years as follows:

The Minitel, this strange little terminal distributed to more than 20% of French homes, was a wonderful success; as was the smart card – another French first. For more than ten years, these two innovations gave France the world's most flourishing online service economy and most secure banking transaction environment.

All firms that have developed business on the Minitel have benefited from a unique opportunity for implementing radically new distribution channels and interfacing their back office systems with their front office customer-facing service applications.

It's time to turn Minitel into an asset before it becomes a handicap.

But even good things come to an end, and it is now time to transform the Minitel into an asset before it turns into a handicap. To see why, let's go back to Dégriftour's experiences, as recounted by Managing Director Pierre Alzon, who was happy to speak to the Cigref group:

Cigref : When it was founded in 1991, Dégriftour group was a pioneer of electronic commerce. How did this retailing method emerge?

Pierre Alzon : We were the first travel agency in the world to distribute products exclusively by electronic media. Today, we have seven years of experience in this area. It has taught us that Minitel created French society's reflexes in using an electronic terminal to go shopping. It opened up and developed the concept of remote information and communication. In France today, Minitel-based mail order sales represent a market of FRF 15 billion (EUR 2.3 bn). Tomorrow this will be an Internet market, but the concept will remain the same.

Cigref : Is France's "Minitel effect" still responsible for the late take-up of the Internet?

P.A. : Bill Gates has explained France's late take-up of the Internet as due to the development of Minitel. And the figures tend to support him. But it's not a question of having the best possible technology. Consumers must first and foremost want to use it. And here France is ahead of other countries. The French are users of a network. They naturally learn to use new technologies. Technically speaking, the Minitel is getting archaic. But, the Internet is just one more stage in the process, not the culmination of all possible customer services. But it is advancing quickly: in October 1997 we were already generating over 10% of our sales on the Web, whereas we only expected to reach this level at the very end of that year.

Cigref : The emergence of Web sites on the Internet brings in new players and new competitors. How do you react to this trend?

P.A. : The competition is there, and comes in several types. There are the mainstream tourist businesses such as tour-operators or airlines. There is also the international aspect to the Internet and the arrival of new players wishing to expand their base markets, and also the technology-driven firms wishing to invest in multimedia type content.

Cigref : Is there a risk that the demise of intermediaries will make operators like Dégriftour irrelevant?

P.A. : We do not experience this in any way as a danger. Electronic commerce is still commerce, i.e. a transaction between a buyer and a seller. It is based on trust, on the assurance that products have been carefully chosen and on the seller's sense of responsibility. Our group adds value to this basic relationship.

Cigref : With your electronic catalogue, you carry out up to a thousand sales per day on the Internet and export your skills. How do you do it?

P.A. : After two years of experimenting, we now have the expertise. We have proved that it was possible to work seriously with new methods of

The Internet is only one step in making services available to customers.

Donald Johnston, General Secretary of the OECD.

“Our sole ambition is to supply our customers with a service that is unique in the world. This means setting up cutting-edge systems of communication with our suppliers, and the best system today for supporting this strategy is our Retail link.”

David Glass, CEO, Wal-Mart Stores

“Electronic commerce is not simply about taking orders over the Web; it means improving every aspect of your relations with your customers and your suppliers. Don’t ask how to do business with electronic commerce, just ask how to introduce electronic commerce into your existing business.”

Werner Ketsch, Vice President, Arthur D. little

“The growth of electronic commerce is a major challenge for the French economy in terms of competitiveness, job creation and exports.”

Dominique Strauss-Kahn, French Minister for the Economy, Industry and Finance

“You can’t just say: I’ll go and have a look. Either you believe, and re-engineer your whole business processes that makes it a major driver of change. Or you don’t believe and you have to suffer the long term

Jean-Pierre Corniou, CIO, Usinor

3 BRIEF USER'S GUIDE FOR DECISION MAKERS

3.1 Think big!

The CEO of Chrysler predicts that 50% of automobile sales will use the Internet.

From one end of the Great Lakes...

According to the Chrysler CEO Robert Eaton, car vendors ignore the Internet at their peril. "Consumers using Internet now have an enormous amount of relevant information about a market notorious for its lack of transparency. The power relation has been inverted." And during a speech given during the annual meeting of the National Automobile Dealers Association, he added that "it would be commercial suicide not to react to these new requirements." Hence Chrysler's radical decision: before the ends of 1998 it will complete the integration its 4,600 agencies into its Web site, from which it is already possible to issue requests for quotes. However, these agencies must all undergo a service quality test before they appear on the list. For the moment, Robert Eaton rules out direct sales for Chrysler. The CEO of the third largest automobile maker in the USA (US\$ 60 bn in sales) forecasts that 50% of new car sales will take place over the Internet by the year 2000, compared with 20% today.

...to the other

Meanwhile General Motors intends to be the first major US car maker to sell over the Web. In light of the success of new intermediaries such as Auto-By-Tel, which claims a network of 2,500 affiliated agents, the Detroit firm wishes to take its distribution circuits in hand. The services will closely link the group agencies together. Via the GM Web site, buyers will be able to select their model, consult the list of agents in their region, request financing, plan a "test drive" and even issue a call for tenders. In this last case, Auto-By-Tel and Microsoft, also at the leading edge with its CarPoint, emphasize that GM will prioritize its own products.

The wind is changing

Certain firms have a talent for adapting to their times and making the most of the *Zeitgeist*. But few of these successes stories have been as large as General Electric, which is today a leader in more than ten different business lines, from health to electricity production via insurance and computing retailing.

It is worth remembering that General Electric is the only firm that has never been off the Dow Jones share index since it was created more than one hundred years ago. When such a firm gets closely interested in a new domain, it makes sense to think that the domain in question is a real

market. General Electric appears extremely interested in electronic commerce; it generated US\$ 1 billion on purchases in 1997 via electronic tenders, is targeting 4 billion in 1998 and has leveraged its skills in this domain to develop its TPN (Trading Process Network). TPN is also used by other large corporations such as Hewlett Packard, which uses it to reduce certain supply delivery deadlines from two months to a few days.

The pioneers are now giving way to industry developers.

In other words, electronic commerce pioneers are now handing over their places to industrial electronic commerce players.

Given the stakes in electronic commerce, many institutions active in macro-economic policy have already examined the issue, and there are very few who have not published a report on it. These authorized information sources are listed in appendix 2. We feel that in the last analysis, electronic commerce is simply a continuation of existing policies by other means. As an illustration, we shall return to the attitudes and goals of five major institutions across the world:

Institution	Goals
US Government	Create jobs, encourage exports, improve productivity in the federal administration.
French Government	Stimulate demand to re-prime consumption and investments, by boosting the confidence of players by means of a suitable technical and regulatory framework, leverage Minitel know-how, beef up SME/SMIs.
European Commission	Complete the construction of the domestic European market, make the Euro play a real role, harmonize income and value-added tax, and protect intellectual property.
OECD	Strengthen the liberal model of development, and show that the market itself will produce inexhaustible sources of wealth.
WTO	Develop international trade, and make massive reductions in customs fees: electronic commerce will have a destabilizing effect.

Electronic commerce : goals of five major institutions.

The government wishes to keep a low profile and encourage self-regulation.

Let's go back a moment to the pretty interesting issue of stimulating demand in France, with a special look at the findings of the commission chaired by Francis Lorentz, who has in a sense been the special vector for this strategy.

One thing is clear: the Government wishes to play a modest role, giving primary attention to self-regulation rather than imposed rules of procedure. No one need complain, except that security stands out as a

cultural exception in the landscape. We shall come back to this in section 4.2.

More interestingly, the French Government seems to have decided to be virtuous and itself start using electronic purchasing, online information services and digital administrative procedures. It is also satisfying to observe that the French customs administration, in de facto competition with its European counterparts on customs clearance, has set up a 100% digitized procedure on the freight terminal at Roissy, clearly adding competitive advantage to this premium “hub”.

Lastly, and most important for the long term, the French Government presented a memorandum to the European Union and its Member State Governments in March 1998, with the aim of creating a Community and international environment in support of electronic commerce.

The expression “Community and international” is important, since even if it can be shown that globalization spreads its power beyond the European Union, especially for business-to-business relations, the importance of regionalization should not be underestimated, nor the fact that the USA has sometimes attempted to impose its views unilaterally, and that it is vital that French interests can be defended by a larger power bloc. And it is by no means absurd to begin with the bloc which alone corresponds to more than 60% of France’s foreign trade.

But while we wait for these messages and documents to translate into real action, let’s look more closely at what businesses know best: i.e. themselves.

3.2 The role of different corporate players

Showcase Web sites might have given some people the impression of a false start.

The previous section highlighted the strategic importance of electronic commerce for certain top industrial players, mainly American. But despite these highly ambitious visions for the medium and long term, the real facts are often far less spectacular: in fact, the first wave of Internet growth in businesses was focused on creating Web showcases and on setting up online publication services. On the whole, the results were unconvincing. Several businesses that invested in Web sites feel they had a “false start” in the electronic commerce race.

The next development wave is already underway; it is set to be demanding and far more profitable. There will be a much broader range of possibilities, but the learning curve will be even steeper, since Internet technologies are making a greater impact on the fundamental business processes and work methods.

Every decision-maker must be convinced that electronic commerce is not just about dynamic young SMEs, where one start-up detects a new niche

before the rest and develops a strategy for gaining market share, plus an active media plan that will one day allow them to sell out to the best offer, making a fortune for their founders.

Already, certain large corporations have gained a significant lead. They often share the same characteristics:

- They generated more than a billion dollars in online sales in 1997.
- They have succeeded in integrating electronic commerce as a separate, independent retailing channel, which generates at least 10% of their global business.
- They have entered the virtuous part of the curve, where growing profit and productivity are so closely related that the CEOs of some of these businesses are now targeting 50% online sales before the end of the century.

We don't expect people to believe what we say: we simply ask them to listen as we try to:

- detail the nature of the processes involved in businesses, showing that they are not just the responsibility of the computing center, marketing director or operational managers, but everyone in the organization ;
- explain that electronic commerce gains immensely from being organized into projects presented to General Management and based on investment decisions taken by the whole executive ;
- show through a confrontation between the Chief Information Officers of two leaders in "Business-to-Business" and "Business-to-Consumer" (Usinor and Carrefour), that Cios are fully aware of the challenges of electronic commerce and of the corporate changes they will be supervising.

Although electronic commerce is not yet a mass market, the first lesson to learn is that there will be winners and losers, and that you have to choose which you wish to be right now...

3.3 Re-engineering processes

To meet these new challenges, businesses must define a three-stage procedure for managing quality and involving the main players in the business:

- draw up well-balanced commercial Internet strategies;
- define projects for introducing user-oriented services;
- create rigorous content management programs.

3.3.1 Drawing up winning strategies

Successful Internet strategies require the participation of two key groups:

- senior managers, working together with a multidisciplinary Internet steering committee;
- a team of experts led by a specialist in Internet strategies.

3.3.1.1 Internet steering committee

No one can say he has a monopoly of good ideas about the Internet.

These days, most businesses find it hard to imagine that a single sales and marketing unit, a single functional department or a single group of experts could exploit the whole potential of electronic commerce. The best Internet solutions are very often dreamt up in the business's gray areas. Which suggests that one of the key success factors is the right mix of people in the business involved in Internet steering committee. These people must come from three corporate nerve centers:

- communication and marketing;
- information technologies;
- sales.

The steering committee is designed to encourage open, constructive dialogue, and supply ideas from multiple backgrounds without going through the hierarchy. Each group of experts must be carefully selected from within the business so that they contribute a variety of knowledge, experience and perspectives. These groups are expected to do the following:

- **Communication and marketing:** ensure that the firm's communication about Internet is consistent with the business's key messages, strategies and goals as well as its image and graphic standards; ensure that the services offered over the Internet correspond to sales and marketing strategies; ensure that communication with employees, suppliers, trading partners and customers remains consistent.
- **Information System:** ensure that Internet-based technologies are chosen in light of computing strategies, architectures and infrastructures; guarantee respect for standards in core software as well as other quality standards; bear in mind issues of systems integration; structure interfaces so as to respond to user needs; show leadership in evaluating the technology feasibility, risks and costs of commercial Internet solutions.
- **Sales units:** evaluate the impact of Internet initiatives on key business processes work methods; re-engineer processes to match the new technologies; evaluate needs in change management, supervision, awareness and training.

In most cases, an Internet steering committee comprising these corporate sectors will be even more effective if it has more representatives from operational and sales units than functional IT, marketing and communication experts. This spread is essential for ensuring that the Internet options suggested for the business are genuinely relevant. As a rule, representatives must be empowered to:

- allocate resources;
- gain support from the Executive Board for allocating these resources;
- set up internal groups to back key initiatives.

3.3.1.2 *The contact with the real world*

At certain times, advice from technical specialists can be a good idea.

Internet technologies are constantly evolving, creating both business opportunities and risks. Specialist intelligence about new trends and developments are critical to the market today. Executives and CIOs are not always familiar with the strengths and weaknesses of the most recent Internet technologies. This means that discussions on strategies can digress on the basis of guesstimates about what is or is not possible.

This is why most businesses need specialist advice to help them work out the impact of Internet solutions on their business (multimedia production, interactive marketing, Internet technologies and detailed estimates of potential costs and growth schedules).

3.3.1.3 *The first “deliverables”*

Once the right team has been set up around the steering committee and supported by the right specialists, efforts must rapidly be directed towards creating [an overview report](#).

This report can cover two major issues:

- an opportunity study (*ideas*);
- the implementation plan (*action*).

However, it is easy to produce a rather bland report when the subject is so huge. The problem is that this will fail to convey the appropriate sense of urgency to Management Board readers, and hence fail to activate the required investment decisions.

It might therefore be useful to include an effort at **marketing Internet projects** among corporate decision makers. We suggest two possible approaches:

3.3.1.4 *Make an inventory of initiatives*

The steering committee will only be set up when there is at least Internet “sensitivity” at different key points in the enterprise.

By searching around a little, the members of the Committee will quickly find that half a dozen projects have already been launched in various units, covering such topics as financial information on the Web, on-line job recruiting, technical databases for distributors, EDI applications with suppliers, sales information by electronic messaging, and so on. Some might regret these spontaneously generated projects, but we feel that this kind of activity helps create the conditions needed to develop e-commerce on a large scale.

A list of these initiatives is therefore an extremely useful “deliverable” which when appended to the overview report, will considerably boost its chances of reaching its objective at management board level.

3.3.1.5 Create a high-profile milestone event

An event organized around Internet projects can boost overall involvement.

A themed event can also be organized as a show, an exhibition, workshops or open days, mixing existing projects with mock-ups of projects in the pipeline.

This will enable everyone involved to visualize often more easily than in a report how the Internet and electronic commerce can really change things for the better in the life of the enterprise. In every case, the aim is to create needs and expectations worthy of the challenge described in the report. It is then time to present this to the **Management Board**, which must lead to the approval of key projects and their implementation.

3.3.2 Setting up services, a sensitive time

Setting up the services does not simply consist in defining the applications and making them operational. There are a number of success factors to take into account. They are:

- involvement of senior management in the process of change;
- detailed definitions of services validated by users;
- confidence in security and payment systems.

Let's look more closely at these three factors:

3.3.2.1 The involvement of senior management in the process of change

Don't forget awareness actions for your senior management.

As in other corporate change programs, many Internet projects get bogged down due to a lack of prior awareness among senior management of the impact on the business, and weak support for change at all levels. This is therefore a priority action point.

3.3.2.2 *The detailed specification of applications*

As we have seen, electronic commerce applications cover a vast range of strategic issues, including technology impact, business processes re-engineering (*BPR*), training and the updating of content.

When preparing these detailed specifications for services, it is therefore essential to put the end user (employee, customer or supplier) at the heart of the design process. Every service and application must be easy to use and must deliver relevant information. Specialists drawing up specifications must work closely with people who have a good knowledge of the content offered by the Internet service, whether new products, recruitment policy or latest data on stocks.

On delivery, properly drafted specifications will help speed up development and make significant savings during the set-up stage.

3.3.2.3 *Security*

Electronic commerce applications must almost always factor in vital information on customers, suppliers and employees. Some of this information is protected for reasons of privacy and security. Specialist help is often needed in the rapidly-changing world of Internet security. It is interesting to note that most security solutions are 20% technical and 80% organizational. Setting up **good procedures** is therefore absolutely key. Moreover, given the importance of the “trust factor,” businesses should define unambiguous payment methods for their clientele.

3.3.3 *Content management, the key of success*

Content management is critical to lasting success.

Once an Internet electronic commerce application is up and running, the management of content and operations becomes the key success factor, since as with any other operational commercial application, its informational content must change frequently (every day, every hour, and more). Unlike paper documents, Internet content is “alive,” and users expect it to be up to date, interactive, and capable of delivering rapid answers to queries.

Processing this “**live content**” is a new challenge for most businesses, and raises many questions about quality control and responsibility.

Each “**electronic document**”, whether carrying stock data, sales data or production schedules, must be updated or deleted according to established schedules. Ideally, it must have an **owner**.

It is very important to consider the level of business control over these documents and to know who is empowered to establish rules and

Get cooperation from IT and core business departments to meet the content management challenge.

guidelines in this respect. Many businesses have to set up internal task forces to deal with such issues as:

- guidelines, standards and management of conflict between head office and sales units over who has control over content;
- classification systems to guarantee that the business search engines, indexes and yellow pages meet certain in-house standards;
- updating procedures for units, task forces and varied types of content, and business productivity indicators giving detailed statistics on which “services” in each application are most (and least) requested by users;
- training employees, certain trading partners and even customers on utilizing Internet services.

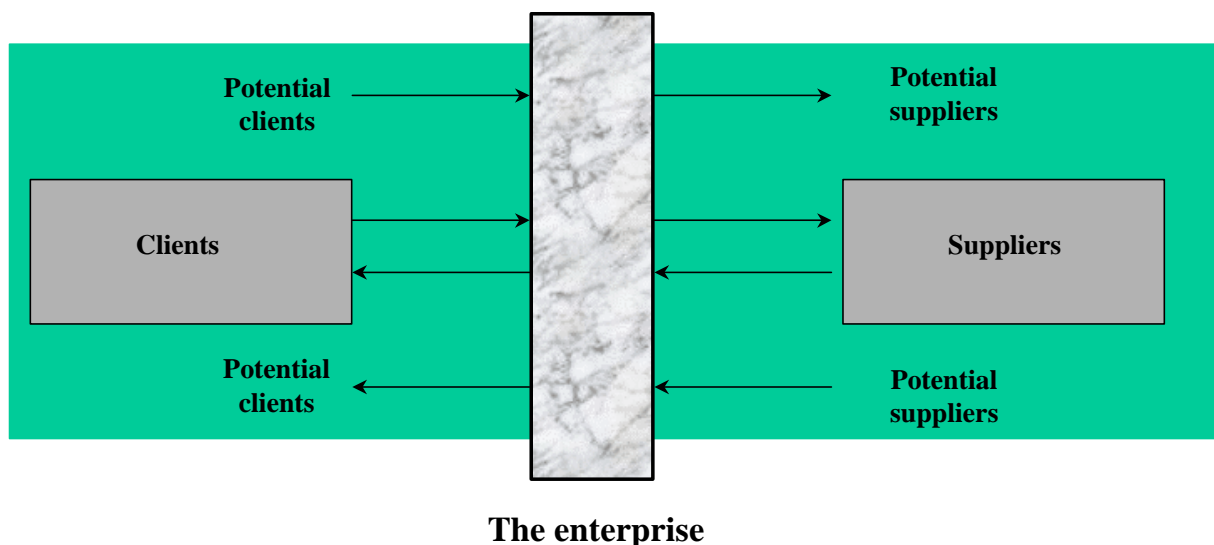
3.4 Preparing investment decisions

The benefits from an e-commerce project must be worth the business reengineering process it requires.

This process is hard to simplify, for the simple reason that electronic commerce is more commerce than electronic, which means that there are as many forms of electronic commerce as there are commerce in general.

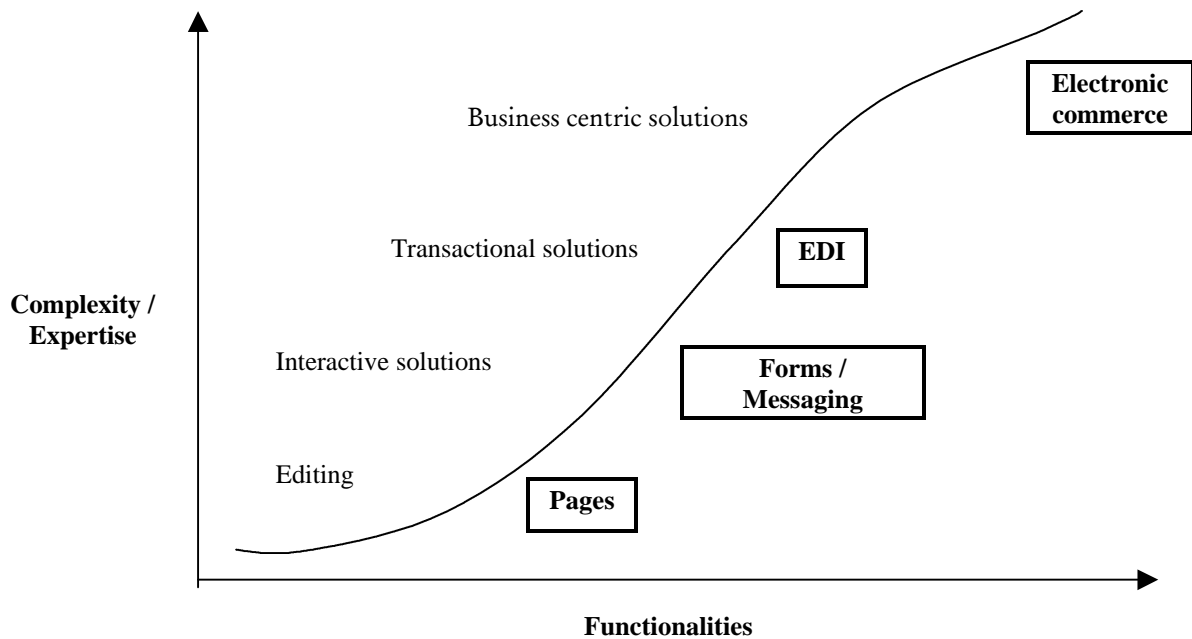
But all electronic commerce project shares one key feature: the more tangible and measurable their contribution, the greater the degree of business process re-engineering required. Now as we have already seen, today’s leaders are regularly targeting a 50% share of their sales from electronic commerce, which is not transparent for operating a business. Hence the following challenges must be met:

Challenges of Electronic Commerce for the enterprise: to develop high payback projects



- To optimize electronic relations with partners
- To look for new partners thanks to “electronics”

To ensure that payback meets expectations, everyone must pull together since once again, electronic commerce extends beyond standard applications and affects the whole business, as this diagram shows:



The path to electronic commerce.

Follow six golden rules for running feasible projects.

To set off down this path, we recommend that decision makers **observe six golden rules:**

1. Identify the potential for electronic commerce in the enterprise's core businesses and how exactly it can be positioned against the performance of other distribution, support and supply channels.
2. Using this carefully digested information, identify the attainable goal and quantify each project dependent on this goal in terms of costs and benefits; evaluate the quantitative benefits in hard currency. Any non-quantifiable benefits must be excluded. Define how each project will add value to the enterprise and ensure that it prioritizes the firm's core business.
3. Sell each project to the operational divisions that will benefit from it and ensure that it is accepted. Appoint a "champion" from the management board who will respond to the project. Do the same with business partners if appropriate.

4. At this stage set up a multidisciplinary team to make a detailed analysis of the economic processes, content and information flows involved.
5. Develop a multi-stage agenda for suitable technical solutions, so that the impact of technology and organizational choices can be measured, along with the quality of the content management system set up.
6. Promote electronic commerce services among targets. Recent experience tends to show that the most successful services include a “communication” budget which is as large as the “development” budget.

Each business will tailor these suggestions to its own situation. It is crucial to accept the consequences of the choices made, as shown in these accounts from two managers we have interviewed for you.

3.5 Usinor and Carrefour: two accounts

Cigref: First a general question: what are the development prospects for Electronic Commerce (EC) in your business sector in general and in your business line in particular?

“The Internet can help develop new end-customer user habits.”

Jean-Pierre Corniou, CIO for Usinor: We have two aspects to our steel-making business: first, direct relations with major industrial customers, involving a number of projects and a fairly well-established use of EDI, with in-depth examination of the needs of the automotive industry for Galia of which we were a founding member in 1984; second, our wish to develop business among users. We especially want to develop the service around the sale of steel; steel is still a largely unknown product despite its long history, and is often considered a difficult material to implement. One of the goals of Internet-based distribution is to develop new uses for steel with end customers through a series of services for those without heavy structures so they can use all our consulting services for making better use of the product.

Pierre Flauto, CIO for Carrefour: For retailing, the approach is fairly similar: on the one hand data interchange with our suppliers, and on the other the mass market – since you need another form of distribution to reach out to end customers; there have been plenty of surveys of market share in this area, and the problem today is to target interested customers and decide on what to merchandize for them.

Cigref: More concretely, it sometimes looks as if EC simply follows trends in the press; but on the whole, is there any money left in your businesses for EC, once the shift to the euro, Y2000 and intranets have hogged the budget?

J.-P.C.: Our response is perfectly clear. EC is an absolute priority, for two easily demonstrable reasons. First: we want to lower intermediation costs of stocks, transport and logistics. Steel products are heavy products and we really want to reduce the need for working capital in our value chain. Second: expansion and growth depend on innovation, product diversification and creating new distribution channels. We believe that innovation is absolutely fundamental to market growth: steel has a strong innovative potential and we are now developing a whole range of products that we are positioning on the market in a fairly spectacular way, e.g., designing light-weight gas bottles, rust-free cars, etc.

Commerce is not just selling, it also involves pre-sales, after-sales, service, advice... and very often ignorance about the product means that users find it hard to understand the interest and novelty in their own value chain.

By providing them with a highly technical and specific service, (on the Internet we are developing a very technical welding aid tool to help people optimize their instruments and weld time by tailoring it to the different products they use) we are reducing the ignorance gap. In other words, we expect a lot from this type of information, since steel is such a traditional product for most people that we forget to supply an instruction sheet, and we realize that lack of knowledge about a product means that it is underused. So we are radically changing this state of affairs, and there is money for it.

“This keeps us advancing. In this field, there is a near immediate return on investment.”

And then, CE is genuinely creating progress, so the return on investment is nearly immediate: first we advance by reducing costs, by creating value both for ourselves and our customer; and second, computing budgets are investments, so if you want to invest in the business, and continue to create value and grow, you have to spend on EC. There’s always money for it somewhere.

Cigref: Mr Flauto, retailing is considered a sector where costs always tight. Is there any extra money in your company for EC in this context?

P.F.: I’ll give you a two-part response: the first covers EC towards our suppliers. It is obvious that we have the budgets to continue to advance and optimize all our data interchange. As for mass market business, I cannot answer today since this subject is currently under discussion and we shall see whether it is voted by the Executive Board at Carrefour to launch a project of this type. Studies are underway, so there is every chance that the budgets will be allocated.

Cigref: Do you anticipate a development in customer demand? Is there a certain customer segment that will prioritize this method of buying? Are you capable of reaching your target market?

“This gives us an opportunity to reach other customers.”

P.F.: Well, yesterday evening, André Santini (Member of Parliament and mayor of Issy-les-Moulineaux in the Paris region) spoke about cyber-grandads: these people are not yet customers at our shops, but eventually through educating them it should be possible to target a complementary clientele.

Cigref: In the USA in firms like yours such as Wal-Mart, you hear a lot about the use of data warehousing to forecast customer needs, and in a sense increase each customer's productivity by offering them products they need when they need them. Are you also paying close attention to this?

“We are studying global buying behavior, not aspects of peoples private lives.”

P.F.: Yes, of course. We have been storing data for some time. But there is an ethical problem with linking check-out ticket data with customer data and one should be very careful. We refuse to make fine-tuned connections at this level; we only seek out global trends to study general buying patterns, but we will never enter into details that would allow us to violate the private lives of our customers.

Cigref: In a B-to-B market like steel, do you feel the growing power of your major customers who try to lay down the law about suppliers, some of whom will jump on the bandwagon while others are left behind?

J.-P.C.: It is a worrying periodic threat: for years I've heard manufacturers say: “if you aren't doing EC next year, we'll chase you”. I personally think there has been clear progress in the car industry (which along with large store retailing is the most advanced B-to-B sector). But in the end, I reckon that change is slower than we would like or fear. The result is that things always seem to improve. EC share in sales is one of my indicators. This has doubled in the past three years. It is still very weak with respect to our own suppliers. So together with the purchasing manager, our priority is to generate organized, structured electronic interchanges with our key suppliers. But this does mean that we are going to eliminate lots of other players... you can't get rid of people just on this criterion. People entering this field are just as good and innovative ... business is part of a greater whole: you can't be good at EC and bad at everything else, it's not how it works. So you have to be good at everything and EC forms part of the overall corporate dynamic.

Cigref: Do you expect any political actions from our rulers, or do you prefer them to intervene as little as possible?

“The government should not act as a brake.”

P.F.: EC is essential, so it will happen anyway, and one should avoid having the Government trying to rule and regulate all over the place in this field, since it would put the brakes on development.

J.-P.C.: The role of Government is to be a facilitator rather than a brake: it must remove legal and administrative obstacles especially in Value

Added Tax (VAT), and onus of proof. There is much in-depth work to do on trading relations.

Cigref: Does the French approach to security worry you in your international trading?

J.-P.C.: No. And to tell the truth, national level regulations on EC are an illusion when you do business with people all over the world everyday. In an international corporation like Usinor, you don't belong to the French market. Our minimum domestic market is Europe and then the global market. We only expect that on the economic and legal level there are simple efficient tools to solve administrative and tax problems. Let the market and private initiative handle the rest, as is the rule in business.

Cigref: If we now look at decision-makers in business, do you think that the members of your executive board are as aware of EC as they should be or is it up to you to promote EC?

“The decision-makers in my business are aware of the need to get there.”

P.F.: Our executive is highly aware of EC, but any investment must first be justified, and today we are studying arguments to check that this new segment is given long-term assurances, even if it does not generate significant income from the start. So yes, our executive is extremely aware of the need to go for EC.

J.-P.C.: It's exactly the same for us: we have a global policy for developing information systems designed as a major vector for boosting dynamism and contributing to the growth of the business. Our president Francis Mer considers that today the main driver of innovation in the group for the next five years is information systems. Information systems cover the whole range of business operations; it is clear that EC is the direct link to customers, and a business only means something if it takes care of its customers, so we shall put the accent on customer relations. We have launched two parallel task forces, one on back office and the other on front office activity. There is still worry about front office activities among traders who have realized that distribution structures were going to change radically in Europe, but they are beginning to invest in these areas, especially the newest among them. So things are moving, but we're still waiting for the evidence that these innovations are introducing genuine changes in our relations with customers. We are in the process of launching a Web server called Sol-line (Sollac on line) at Sollac, which will be used to validate in a series of well-identified segments what the possibilities are for developing our business via the Internet. This decision was taken by Sales and Marketing, with all the necessary support from the group as a whole. In other subsidiaries, we are also quite advanced, especially in one called IMS which is very a large distributor of technical products for the whole of Europe, and is developing a highly ambitious project of transforming the whole chain right to the end customer into an

Internet link. The message here is that even in traditional sectors, there is clear evidence of value creation through EC.

Cigref: There are two schools of thought on this: the first says that you have to start by slightly peripheral projects, while the second approach, chosen by current EC leaders such as Dell and Cisco, says that there is no point in starting off in this field if you cannot attack at the heart of this business extremely quickly, which means gaining the interest of general management, especially since this approach entails a reform of business processes.

“This means facing major process re-engineering.”

J.-P.C.: We are in the process of re-engineering our business processes. EC in the broadest sense of the term is one of the main re-engineering factors. First between the group’s various components, since we have many subsidiaries working together...and we suddenly realized that we would lose lots of money by handling manual operations between subsidiaries. And second with respect to customers, we are naturally deeply committed towards the automotive industry, but we are also extending this method of

working to large-scale packagers such as Carnaud Metalbox. I am convinced that you can’t get into EC without business process re-engineering: you can’t set up a customer-facing showcase that distributes messages if the company doesn’t change internally.

Cigref: To end, do you believe that EC may accelerate the decline of traditional players and facilitate things for new entrants to this media?

P.F.: In the mass retail market, the world is continually innovating, with everyone wondering what the store of the future will be. It is more than probable that another more profitable model will emerge in EC.

“The race is on... and it will never end.”

J.-P.C.: We are paying a lot of attention to the weak signals coming from the market, since even for a product as work-intensive as steel, EC has enabled new entrants to arrive on the market, and this hasn’t happened for a long time. There is no escape from people who are more imaginative and effective than we are. But we also think customers buy a global set of services, which means that the in-house engineers that we have for several years seconded to our customer’s research centers in the automotive or packaging sector will make a strong contribution to creating customer loyalty. So we listen closely and keep fighting, and this will go on, since today it is absolutely clear that businesses are rebuilding themselves around electronic processes, and that the steel industry is no exception.

4 HOW TO PREPARE YOUR BUSINESS

4.1 A brief map of electronic commerce

One way of characterizing electronic commerce applications is to categorize them in terms of the business unit which is most affected. Typically this means:

- direct marketing applications (promotion / generating qualified contacts);
- sales applications (online sales);
- after-sales applications (information, repairs, etc.);
- logistics and accounting applications (e.g., EDI).

The advantage of this approach is that it can be mapped onto the projects underway in different departments in a firm and allow the ROI to be calculated on paper. But its major drawback is that it operates too far downstream, and ignores the inherent cross-functionality of electronic commerce and the re-engineering required for its underlying processes.

This operational classification therefore needs to be preceded by strategic thinking. Any decision-maker must approach this with two key questions in mind:

Each application must have a target and a goal...

- Are my electronic commerce applications designed to grow sales or lower costs?
- Is my target the installed customer-supplier base, or is it new contacts?

You can always argue that you are aiming for all the goals cited above, but in the end each project inevitably has one dominant goal. In this context, the critical categories would be:

4.1.1 “Gaining market share” applications

customers.

As the name suggests, these applications aim first at attracting **new customers**; as a result, the firm will soon be faced with a major choice between:

- developing one’s own electronic commerce site can lead to a number of constraints, but allows you to keep control over its retail policy and son **brand image**,
- and handing over to a *shopping mall*, which makes for a less painful start-up but does not offer the same long term warranties.

4.1.2 “Order taking and delivery” applications

...Develop sales for the installed base.

This is one of the most complex applications but has very high potential. More focused on the **installed base** than the previous approach, but always designed to grow sales, it can be subdivided into two categories:

- “**interactive services**”, which enables anyone connected to business network to order services or equipment from suppliers who have negotiated group-level framework contracts (such as Dell), or which enable “cross-selling” techniques to maximize sales generated by an existing customer;
- “**just-in-time services**”, which enable the business to tailor production and deliveries to order volumes, whether actually recorded or simply anticipated (e.g., Wal-Mart) from the analysis of behavior during similar periods in the past.

4.1.3 “Customer support” applications

...Lower costs.

Once again, this targets an installed base, but the critical factor here is **cost**. It involves setting up structures to save on **gray matter**. So this family of applications is also one where the transactions as such are less often the key element.

This family of applications includes:

- “**alternative services to branch networks**”, most familiar in sectors that sell non-tangibles such as finance,
- “**partner spaces**”, which enable industries who have to renew their product range increasingly often to support their distributors more cheaply, by providing them with knowledge bases on new products, or of configurators and order taking applications which carry a good part of the costs of training, integration and input for the distributor. But for distributors, it is often either that or disintermediation.

4.1.4 “Purchase and provision” applications

...Improve supplies or purchasing.

Commerce means Demand and Supply. So there are two major trends in electronic purchase:

- **electronic tenders** (e.g., General Electric);
- **virtual marketplaces** (or spot markets, on the model of NASDAQ) specialized in one type of product.

While EDI is used today by businesses basically to optimize their supplies, and is only concerned with tenders for delivery between specialized departments in contractual partners, this application covers:

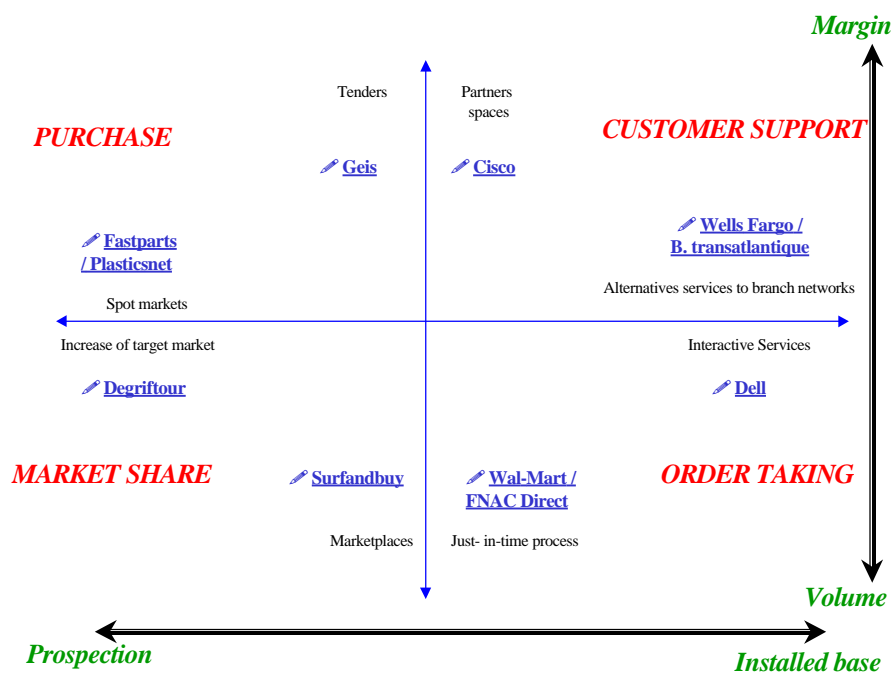
- on the one hand, once the contractuals are established between the firm’s Purchasing Department and its supplier, this system offers

purchasers a method of making their orders (or following them up) directly from electronic catalogues; these orders are regulated by a set of fixed rules on budgets, amount of order, etc. (e.g., the operator Citius marketed by EDS);

- on the other, to enable hitherto unidentified suppliers of making themselves known to the Purchasing department, thereby broadening the supply potential and hence impacting prices.

Even if the “cost” factor is clearly present, the key novelty here is to expand awareness of suppliers’ quotes and hence helping businesses to renew their product portfolios more effectively.

With this roadmap, the situation is now as follows (The full addresses of these online services are found in Appendix 1):



What electronic commerce may change in your business.

4.2 Managing transaction flows

NB: The terms in italics refer to the glossary in appendix 3. We advise readers to browse through this first, given the proliferation of unavoidable acronyms and somewhat opaque concepts used in this section.

4.2.1 Security, critical for confidence

The supposed absence of security is often seen as a key obstacle.

The lack of security is often mentioned as the main obstacle to the rapid growth of the market for electronic commerce, especially the Mass market. Indeed, any data on the network can be copied, rerouted and falsified. So the partners in this communication on the Internet support the following risks, for which we give the most widespread responses:

Modification of the data sent over the network

Data integrity means checking that this data has not been accidentally or intentionally altered. Technically this involves “signing” the information sent: if one single bit of the message is changed, its signature is radically changed too.

Abuse of identity

Checking on partner authentication helps ensure that the correspondent connected is indeed the announced correspondent and also guarantees the signatory of the deed. Technically, certificates accompanied by keys and checked during every act of communication enable you to know who is who.

Repudiation of the origin or the reception the information

Checking non-repudiation helps guarantee the authenticity of the deed. Neither sender nor receiver can deny depositing or sending the information, nor its content. Technically, the transaction must generate receipts, and be stored in a indelible and unalterable way.

Divulging information to an unauthorized third party during transfer

The protection of privacy makes the information sent meaningless to the third party, and prevents the fraudulent use of credit card numbers by an unscrupulous trader.

There is a technical solution for each risk, usually based on encryption, and the utilization of a certain number of secure payment protocols. Let

us see how these different techniques have been taken up in the main industrialized countries.

4.2.2 Survey of projects in Europe

N.B.: This section is based on a number of facts published in the E-Business publication over the past twelve months (see Appendix 2).

SET specifications have been adopted by large corporations.

In the area of payments, the main industry effort, with the clear ambition of developing a global standard, has been put forward jointly by Visa and MasterCard. The *SET* (Secure Electronic Transactions) specifications have been published, and influential firms such as IBM, Microsoft and Netscape, have invested considerable resources in creating compliant products and demonstrating the interoperability of solutions based on these specifications.

The *SET* solution basically covers the needs of transactions currently carried out by mail and telephone. For these transactions, we may consider the security environment as deficient. The solution starts from the most typical user environment, i.e. a stand-alone PC, and provides sophisticated protocols for ensuring secure remote payments. Although this is a major improvement on current practice, it is a purely software solution uniquely adapted to PCs which are easy to defraud. The first version of *SET* addresses bank cards and especially credit cards. The solution's promoters have identified the security weak spots and are examining how to gear up the system for the next stage with the utilization of smart cards.

Scandinavia / Spring 1998

Scandinavia is the prodigal child of *SET* implementation. One of the decisive factors has been the unity among Nordic banks, as they restructure and set up regional-wide mergers. The champion is Finland, where the national issuer of bank cards, supervised the execution of the first *SET* 1.0 transaction on December 17, 1997.

In Sweden, a pilot phase of 8,000 Internet surfers and 40 Swedish traders is planned for the advance commercial deployment of *SET*. The total budget earmarked for *SET* varies between FRF 75 and 100 million (EUR 11.4 and 15.2 million).

Banking unanimity is also crucial in Norway even if two separate *SET* projects have been launched. The largest brings together Christiana Bank, the country's second largest commercial bank, the banking and insurance supplier Gjensidige and the country's largest savings bank Sparebanken Nor which has just merged with Fokus Bank.

The second — smaller — project, launched by EuroPay, involves the Norwegian Dnbnordske Bank (DNB). This contract will be managed with the support of IBM, since EuroPay will use its banking gateway and certification authority. These services have also been chosen by one of the German *SET* projects and in partnership with IBM, has just been sold to the Hungarian Inter-Europa Bank. It is extremely likely, then, that Scandinavia will be the first region in the world to generalize the use of cross-border *SET* payments.

Germany / Spring 1997

The German banks have jointly defined their own online banking standard HBCI (Home Banking Computer Interface). The specifications of version 1.0 clearly define the methods for transactions: authentication is ensured by the use of a pair of *RSA* encryption keys, message integrity is guaranteed by a Hash key, and content security is provided by a *DES* triple symmetrical key. The specifications are adapted to the communication protocol of the German Minitel, BTX.

An improved version of the TCP/IP protocol is also factored in. There will be full migration once Web browsers can handle the complexity of the operations defined by HBCI. To ensure total security, version 2.0 of HBCI will be adapted to smart cards. It will converge with the “GeldKarte” electronic wallet promoted and used by the ZKA consortium. ZKA also enjoys the support of the whole the German banking sector.

Germany / One year later (Spring 1998)

The extremely powerful German savings banks, which collectively cover more than 50% of the domestic banking market, are active everywhere with respect to new methods for electronic payments. After launching the new GeldKarte (electronic wallet integrated on EuroCheque cards) in Spring 1996 and now distributed by its members in more than 20 million copies, the savings banks are now embarking on electronic commerce.

The GeldKarte can now be used in a Bull smart card reader attached to a PC to download and pay with electronic money on commercial Web sites. Half a dozen candidates are already operational. Note that although the GeldKarte is compatible with *EMV* level 1, it uses only *DES* symmetric encryption and a PIN code for authentication.

Second, the savings banks are climbing on board *SET*. Fifteen thousand German net surfers will be equipped in the pilot phase. At the same time, all these banking institutions will subscribe to a common *SET* banking gateway supplied by IBM.

UK / Spring 1998

In partnership with EuroPay International, Barclays Bank is testing Internet payments using a *EMV* smart card equipped with debit and credit functions, with a specially tailored new protocol called *SCPP* (Smart Card Payment Protocol). This choice of *SCPP* is significant since it counters the three scenarios set out at the beginning of 1998 by Visa to facilitate the eventual merger of the smart card with *SET*.

This fourth option is based on the specifications developed unilaterally by EuroPay International, based in Brussels. *SCPP* is being implemented within two Barclay's Bank *EMV* pilot projects. Barclays is proving a dream team partner for EuroPay, since the second largest UK bank has long been a firm opponent of the complexity and development costs involved in *SET*. At the same time, EuroPay's capacity to react makes it a formidable competitor to Visa, for whom Banks Barclays is the leading card issuer (2 million) in the United Kingdom.

Put simply, *SCPP* is trying to radically simplify *SET*. For starters, the electronic wallet only weighs in at 100 kB, compared to 2 MB for its *SET* equivalent. It is written in C and will soon be available in Java. This generic wallet (since it contains no information about the carrier) is not downloaded to the *EMV* chip, but to the Web surfer's hard disc. This means that it can be used on any terminal, provided it is downloaded each time.

This level of portability is not always available for the software version of *SET*, which must be fully installed on the Web surfer's hard disc (including private key).

There is the same desire for transparency of use at the reader end since *SCPP* is compatible with PC/SC specifications, promoted by Microsoft and the major smart card industrial players.

Last but not least, according to its promoters, implementing *SCPP* with an *EMV* smart card is ten times easier than with the software version of *SET*. *SCPP* is keeping up with the times, since it also supports the TLS (Transport Layer Security) smart card, *SSL*'s successor, integrated into most browsers on the market. In other words, this represents a fairly large-scale counter-blast to *SET*.

4.2.3 And in France?

In light of its know-how in secure bank transactions (France is one of the Western countries with the lowest incidence of fraud) and of the strong smart card penetration rate, France saw a number of different proposals start arriving in 1996. The Kline product (a Paribas subsidiary), appeared at this time, and has regularly expanded ever since into a family of payment products for individuals (Klebox) and businesses (Klebox).

corporate). Today, through its management of the financial flows during the transaction and by transferring the trader's responsibility to the banks, Kline offers an interesting business model. Its main limitation is the low number of PCs fitted with card readers.

In an attempt to overcome the problem of variant terminals, the key financial houses tried to get together in 1997 to limit the number of proprietary solutions and maintain a high degree of inter-bank activity. This led to the creation of two large consortia. One is E-comm, comprising three major banks (Société Générale, BNP, Crédit Lyonnais) and three technical partners (Visa, Gemplus, France Télécom), built round the *SET* protocol. The other consortium is C-SET (sometimes called Cybercard), uniting other French banks around another architecture.

After about one year of parallel experiments, the two consortia finally decided to create a joint company with a single set of technical specifications based on the *SET* protocol with digital ID integrated on the smart cards themselves. The cards would be controlled by the French banks (this ID management is directly inspired by the original C-SET project agenda).

E-Comm and C-SET have joined forces to integrate SET into smart cards.

There is still a problem in handling and deploying foreign card holders wishing to make payments using the *SET* protocol without having smart cards, and this will take time and money. We shall simply note that C-SET and E-comm, both experimental projects, each required FRF 100 million (EUR 15.2 million) in investments.

This will not stop each financial player from developing their own services if they feel the need. The market looks big enough to satisfy every innovative urge.

An example of implementation: the CCF

At the end of 1997, the CCF became the first French bank to use strong encryption for its new Web server, BancoPC (monthly subscription). Whereas the banks at the time were criticizing 40-bit degraded keys, the CCF was authorized to secure its Web server right from start-up with the 128 bits DES. Practically speaking, this opened up the possibility of providing real transactional services. The CCF customer would have access to the complete range of account management facilities, but could also make cross-account transfers, and buy and sell mutual fund stock on Banco PC. The fees charged were very low.

The CCF was the first to offer real transactional services.

When it realized the competitive advantage offered by the Internet, the CCF decided to up the ante. By the end of 1998 the Banco PC Web site will display an icon that customers can click to start (via the RTP

protocol) a phone conversation with their favorite account manager, who will have access to specially displayed data sheets about the customer.

The CCF has built up trusting relations with its SCSSI (French central information system security department). And one of the main effects of all this is that it gives official sanction to the low-profile role of the SCSSI as the *trusted third party*.

In the case of the CCF, the bank's customers will download (together with a Java applet encapsulating the 128-bit DES algorithm) the cryptogram created by the 512 bit public key the SCSSI from code key. This means that exchanges encrypted by the first of these keys (known as a transfer key) can be intercepted and decoded by this organization by means of its own 512 bit private key.

4.2.3.1 Towards an understanding between encryption and electronic commerce

The regulatory situation in OECD countries is far from being homogeneous

All the projects described above are developing against a country-specific legislative and regulatory environment for civilian and military technology: namely, encryption. At the beginning of 1998, the OECD surveyed this situation and found that in the OECD area, practice is by no means homogeneous. What is special about the French situation is the existence of a number of legal measures governing the use, supply and export of encryption tools. We shall try and assess what impact this could have on French businesses.

The new French encryption scheme recognizes the economic significance of electronic commerce in the coming years and attempts to organize development in this respect for both businesses and individuals.

This liberalization is based on the existence of trusted third parties of two distinct types:

- the approved bodies that allow the use of strong encryption;
- certification authorities ensure applications linked to digital signatures.

The new encryption regime was created in February and March 1998 through various additional decrees and rulings added to Law n° 90-1170 of 29 December 1990 modified in July 1996 on the regulation of telecommunications. We give the main characteristics below. A more detailed analysis can be found in *La cryptologie, mode d'emploi* (Encryption: a User's Guide) published by the Ministry for the Economy, Finance and Industry.

Elbow-room in using encryption methods and services

Users now have total freedom to utilize digital signatures to authenticate and ensure the integrity and non-repudiation of messages.

In the same way, there is complete freedom to ensure the privacy of messages:

- either by means of algorithms using keys of under 40 bits;
- or by means of “strong” encryption, provided that the secret system used is placed in the keeping of a body approved by the SCSSI (Central Information Systems Security Department). In the contrary case, it is still necessary to have SCSSI authorization.

Liberalizing the supply of encryption methods or services

The encryption régime puts the main onus of regulation on professionals in the sector; it is they who must obtain the necessary authorizations and inform the government of the products they are putting on the market.

The following table (source: French Ministry for the Economy, Finance and Industry) shows a certain degree of liberalization in the procedures associated with supplying, importing and exporting methods and services which do not provide strong privacy.

Purpose	Functions offered			
	<i>Authentication, signature, integrity, non-repudiation</i>	<i>Privacy</i>		
		<i>£40 bits</i>	<i>>40 bits</i>	
			<i>With escrow</i>	<i>Without escrow</i>
<i>Utilization</i>	FREE	FREE	FREE	Requires authorization
<i>Supply</i>	Requires simplified declaration	Requires declaration	Requires authorization ¹	Requires authorization
<i>Import</i>	FREE	FREE	Requires authorization	Requires authorization
<i>Export</i>	FREE	Requires authorization	Requires authorization	Requires authorization

Synthesis of the new French legislative and regulatory scheme as of 4 June 1998.

Trusted third parties

The liberalization of these procedures is based on the creation of trusted third parties, which act on behalf of users to carry out certain operations concerning the management of privacy keys or of digital signatures.

These two functions are quite separate, even if the same body can carry out both of them. They are based on distinct legal regimes.

¹ Government responses to all requests for authorization take 4 months maximum.

Escrow agencies

The bodies responsible, on another person's behalf, for depositing and handing back to the approved authorities the secret agreement on encryption methods and services for strong privacy, must first be approved by the Prime Minister's office, following the referral of their request by the Central Information Systems Security Department (SCSSI).

These bodies are known as “**escrow agencies**”.

They preserve the secret agreements of their customers:

- either by delivering them to these same customers, if they request it (depositing and delivering the secret agreements for the user's benefit);
- or by handing over or implementing for the benefit of the authorities empowered by the law on the basis of the methods defined by the Criminal Code for legal authorities, or by Law n° 91-646 of 10 July 1991 relative to secrecy of telecommunications-enabled messages for the Prime Minister (handing over or implementing the secrets agreements for the benefit of the approved authorities).

The trusted third party function meets both user and government security needs.

This provision combines the legitimate need for user privacy with the government's security requirements. Our messages can be read, but only from within a legal framework, with:

- the possibility for any physical or legal person to access unencoded information about them as proof in legal cases;
- an obligation for trackability and imputability;
- an obligation to implement a policy of physical and logical security;
- an obligation to protect named data;
- an obligation to respect professional secrecy by all partners;
- an obligation to lodge a complaint against any break-in or attempt to break in;
- heavy penalties in case of non-implementation.

Certification authorities

The management of the secret agreements on digital signature is the responsibility of a body known as “**certification authority**.” The role of this authority is to produce and manage public key certificates used for digital signatures, which can ensure identification, authentication, data integrity and non-repudiation.

The certification authority's main tasks are:

- creating certificates for secret key holders;
- publishing certificates;

- canceling certificates;
- interfacing with other certification authorities.

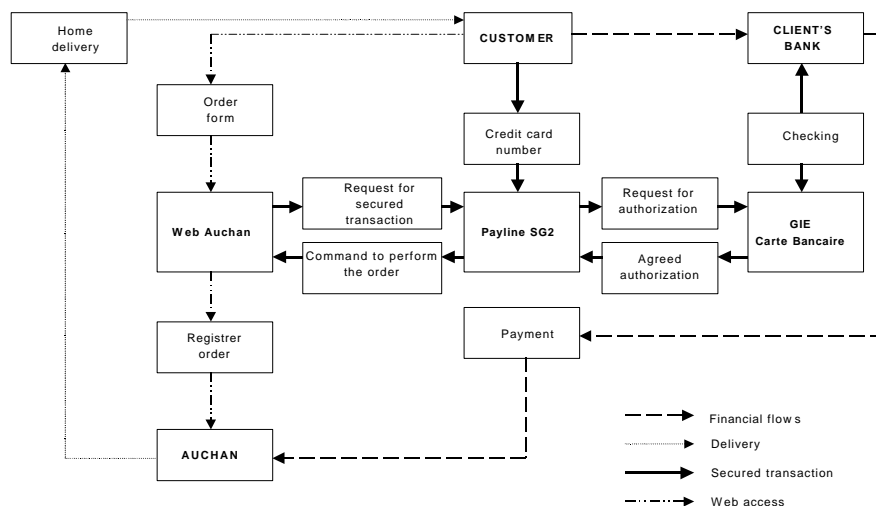
As part of these functions, the certification authority supplies an encryption service which must be declared to the SCSSI as such under the law. Since privacy is not one of its functions, the simplified declaratory scheme can be chosen.

4.2.4 The way ahead for French businesses

As a first assessment:

- For online traders, the decrees of February 1998 play a key role since they stipulate that digital signatures are free and access codes are encryptable. Server access can now be properly protected, provided that traders provide their customers with the appropriate software.
- Taken together with French know-how in smart cards, these provisions should kick-start a national market for mass market electronic commerce applications. The first applications such as that developed by the Auchan supermarket chain, have already begun, using solutions available on French territory.

Regulation will help kick-start a national consumer market.



Management of transactions on Auchan Web site.

- However, this brings no notable improvement for international transactions since the French solutions are not compatible with those of our European partners; above all, it is not always possible to ensure the privacy of trading. Protection and encryption levels remain the responsibility of the Prime Minister's department (SCSSI).

The next challenge is Europe.

- This may negatively impact business-to-business relations, which are deeply involved in the international context on a daily basis. When a large part of Europe is putting the finishing touches to the unified market and preparing for the single currency, the current situation in electronic commerce is somewhat paradoxical.
- It is worth noting two initiatives from European institutions:
 - a communication from the Commission of the European Communities: “Ensuring security and trust in electronic communication – Towards a European framework for digital signatures and encryption,”
 - a draft “European Directive on a common framework for electronic

To summarize, the projects that French firms should prioritize in the short term should factor in this new situation:

- **The national consumer market is now approachable.** The trusted third party scheme should become less of a brake of progress provided that more French enterprises support the technical solutions chosen by the major French banks, since they would pose less of a risk of either non-approval by the government or premature disappearance, given the investments at stake.
- **The business to business market is even more promising** since it will either mean no on-line transactions (the customer support situation described below, aimed primarily at making better use of the corporate human knowledge base), or will be based on proven invoicing methods (paper or EDI).
- the **international consumer market is not risk-free** in terms of authorized security methods. Every one should therefore balance the level of acceptable risk against the new target market potential.

4.3 Managing flows of goods

The transport integrator example

In 1996, the US firm Federal Express (FedEx) was one of the first to use Internet to develop competitive advantage in what was a highly competitive environment. The chosen application was obviously that of goods tracking.

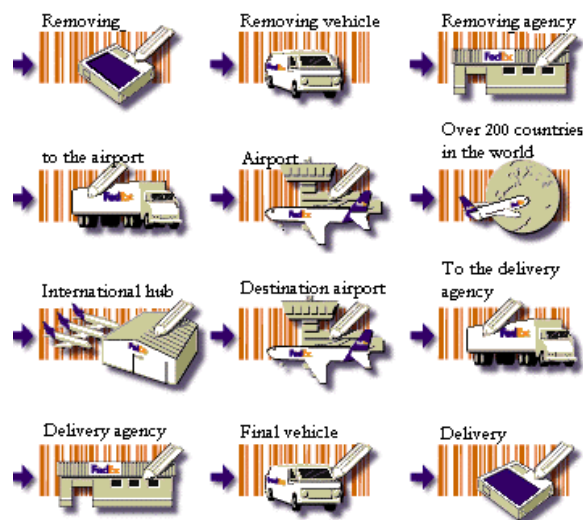
For some shippers, 95% of goods tracking requests are made online.

Over time, the FedEx service has penetrated continually deeper into its clients information systems, to get as close as possible to information about the end user (who is not usually the general department contact person known by the shipper).

Most of FedEx's customers have followed in their footsteps and some of them acknowledge publicly today that 95% of customer requests to track goods are online.

Anyone who has had to send an express packet abroad and wanted to know that it arrives on time can appreciate the advantage of such a system.

For the others, here is a brief summary of the obstacle course facing goods sent by integrators such as DHL, UPS and FedEx:



Under these conditions, there is little risk in saying that the future will belong to the firms that can offer the following on each of their customer's work stations:

- an easy-to-install software package allowing instant tracking on the Internet (and often via the corporate Intranet as secure gateway) the progress of their national and international packages;
- easy, quick information on each package in a multi-package delivery;
- package tracking using the client business's own order and invoice number;
- reception and print out of proof of delivery (physical image of signatures for shipments to countries recognizing this system).

FNAC Direct

The FNAC (a French cultural products chain) has in the past two years developed a multi-channel policy, since its customer base is increasingly segmented. This has translated into the setting up in April 1997 of a mail order sales service called “FNAC Direct.” During the start-up phase, FNAC Direct (which is part of the Pinault-Printemps-Redoute conglomerate) could leverage existing skills at la Redoute for marketing and logistics. 400,000 references can be ordered today by telephone, Minitel or over the Internet.

Nine months after the service was launched, ordering frequency over the Internet has risen six fold and the Internet already accounts for 25% of sales (a third of them from abroad), which is about equivalent to Minitel-enabled sales; the remaining 50% are from telephone orders. Total sales for the first year amounted to FRF 10 million (EUR 1.5 million), set to rise to FRF 500 million (EUR 76 million) by 2001.

This strong growth has rapidly impacted the logistics chain, given that the average order stands at about FRF 300 (EUR 46). While the logistics were handled at first by FNAC Étoile, the rise in volume meant that very soon the “virtual” shop had to have its own supply chain. For several months now, products leave the Morangis warehouse, in which FNAC Direct now has a share.

Logistics is a key component.

This shows that logistics is a key driver of electronic commerce, and essential for managed growth. Skilled external partners can play an undeniable role here, and FNAC Direct uses La Poste and UPS for its deliveries.

More generally, the logistics break down into three major tonnage categories:

- large-scale logistics (cargoes of more than 40 tonnes, shipped by train or ship);
- medium-scale logistics (palettes delivered to small supermarkets and warehouses);
- retail logistics (individual packages).

For several reasons, the third category raises most questions today:

- carriage costs can be extremely high compared to the gross price of the goods (especially for fresh or fragile produce);
- at one end of the chain, packaging represents a cost of which users are unaware: this is the “picking” (or free service) phenomenon of super markets, and having customers wander through hypermarkets with their carts is still the most cost-effective method;

New services are attempting to provide delivery solutions.

- at the other, individual delivery is a risk factor, since statistically individual customers are far more often absent or late for delivery than professional customers. Integrators whose delivery system is based on the round, are not necessarily the most suitable suppliers.

There are several initiatives coming on stream in a potentially highly fertile field for innovations and probably a service job creator. For example:

- Setting up neighborhood relays (inaugurated a few years ago by La Redoute and les Trois Suisses) which can be used to deliver goods whether or not the customer is there.
- Home delivery service subscriptions (in US residential suburbs where individual houses are the usual form of residence), offered by supermarkets which install ad hoc containers in your garage (including freezers and refrigerators) and deliver the goods using supplier-installed codes on the door.
- The creation (again in the USA) of “spot markets” for Internet courier services, where delivery loads are auctioned off in real time.

The cyber-shop which delivers as quickly as if you went to pick up the goods on site are still on the drawing board. But, as we see it, there are people working hard to create them.

4.4 Information flow management

4.4.1 The infrastructure obstacle

The development of this branch of electronic commerce is closely linked to the possible deployment of Extranets or other network linking together communities of interest through interactive information services – and hence to people seeking proper user comfort. This debate forms part of the current thinking along the various Member State governments of the European Union on network convergence.

Cigref's assessment is that there is service convergence on a local level once several types of infrastructures are on hand to carry IP flows, under acceptable bandwidth conditions.

Today, there are still barriers to convergence in the infrastructure. Among the major barriers, these are the problems cited by our members:

- managing **rare resources** (frequencies, numbers, prefixes, domain names), which are ripe for improvement;
- user access via **diversified metropolitan networks**, cable TV, wireless access or xDSL technologies through unbundled local loops;

- clears signs of the authorities boosting **player confidence** in new technologies, with priority concern focussed on encryption legislation and the protection of the private data (see previous section);
- unanimous concern in various guises with the **price of telecommunications**: the price of long distance calls, lack of combined discounts, fixed line to mobile tariffs, excessively costly high speed services, etc. The message is simple: carriers must drop their prices on all these services, since their customers will more than offset the reduction in unit prices by a rise in volume. This experiment was tried in France in 1997 for medium and high speed connections, and delivered convincing results since a drop of some 25% in tariffs led to an over 40% rise in call volume.

Telecoms prices in Europe are still too high.

We consider it absurd to talk about convergence, and hence of the massive provision of interactive information services without systematically removing these brakes, and we obviously hope that there will be significant progress in these areas as soon as possible.

This has not prevented a number of success stories such as Cisco's, that we shall look at now. But it automatically limits the potential impact to the business-to-business market alone, since these are the only players to have the required communication infrastructure. The lessons that can be learned about how quickly social health network professionals were able to deploy their system will be described below and will almost certainly be of interest, since by virtue of their size and their tendency to re-tool, professionals form an intermediate category between businesses and households.

4.4.2 The flagship application: customer support

Cisco

Cisco, although less known on the mass market than Microsoft or Intel, remains one of the most spectacular high tech success stories of the last decade. A world leader in local network connectivity with more than 60% of sales in the market, Cisco will generate around FRF 50 billion (EUR 7.6 bn) in sales in 1998, underscoring an annual growth rate of no less than 70% during the past four years.

Cisco reorganized its customer support services around the Internet.

Keeping up a growth rate like that creates a number of significant challenges: handling recruitment (1,000 new jobs per quarter) and integrating new recruits into existing teams, customer support, training distributors in product ranges that are 50% new every year, handling orders and meeting delivery deadlines.

So as to avoid the boom-to-bust syndrome that has affected other businesses that grow too fast, Cisco has set up a highly robust, three-level communication infrastructure:

- a data communication and electronic messaging network links all Cisco sites worldwide; employees can access it from both office and home (the least a connections specialist could do, surely);
- intranet applications optimize resource and knowledge sharing inside the business, with real time updating of information;
- extranet type applications (either paying or not) for distributors and major Cisco customers.

The results show the potential of these technologies when supported by a whole business:

Internally:

- Corporate electronic directory accessible by everyone,
- 70% of internal office automation support requests sent via the Intranet.

Externally:

- Error rate in order inputting has fallen from 20% to 2%,
- 42% of the Extranet-enabled orders, with a 60% end of year target,
- One billion Francs (EUR 152 million) in savings on customer support due to the Extranet, and 15% time saving for the sales force,
- 90% of the software versions are distributed electronically, making savings of more than FRF 600 million (EUR 91 million),
- Customer satisfaction rates have increased from 3.4 to 4.2 out of 5.

Cisco has drawn ten lessons from this experience, and while they lack the authority of the ten commandments, they are still worth examining closely. By the way, one may compare them with the six golden rules given in section 3.4.

THE TEN LESSONS OF THE CISCO EXPERIENCE

1. Focus on the company's core business.
2. Remember that an electronic commerce project works with customers, not technology.
3. Emphasize information sharing and team work on systems.
4. Be prepared to re-engineer internal processes to factor in the new model.
5. Ensure that content is efficiently handled.
6. Involve partners in the development by asking them what they need.
7. Prioritize a stepped approach, with intermediate deliverables and audience measurements.
8. Set up a multidisciplinary team to coordinate the projects.
9. Build on reliable, secure network infrastructure.
10. Make yourself known and have access to an adequate promotional budget.

4.4.3 New opportunities

4.4.3.1 The application with a future: purchasing

In mid 1997, *E-Business* reviewed the situation in the following way:

“Purchasing departments stand at the eye of the business-to-business electronic commerce cyclone, but their companies don’t realize it.” This is one of the conclusions of a study carried out in France by IDC.

This study examined 70 corporate purchasing departments generating a minimum one billion Francs (EUR 152 million) in sales. Only one third of Intranet projects include purchasing-specific applications, even though there are plenty of such applications available. Purchasing departments can now carry their tenders for bids electronically, reply in the same way, access electronic catalogues, send orders and activate logistics tracking. In a word, they can redesign all their processes.

But, to date, only 6% of them are fully committed to ordering over the Internet, while 9% have a project. 45 % of them consider it legitimate to look into this new media. But 40% of them reject it. Top of the complaints list is the lack of technology stability and of course, the lack of security.

Buyer behavior must integrate with the Internet more closely.

However, the needs expressed by purchasing departments should help electronic commerce to flourish on Intranets. 71% of those asked feel that collecting and receiving internal needs is one of the major methods for boosting awareness. In relations with their suppliers, 43% still consider that their selection also needs improving, 34% consider that expressing needs is priority and 30% identifying suppliers. All of their needs can be satisfied by the intelligent use of the Internet.

But these purchasing departments must still want to do this. When asked about having to improve their productivity, their response was extremely modest. To avoid being sidelined from Intranets, purchasing departments will first have to re-think themselves internally...”

1999 will be a turning point in B-to-B purchasing.

Since then, due to the arrival of systems such as TPN (Trading Process Network) or B-to-B spot market software such as Citius and Connect, mindsets are starting to evolve in the right way, but more towards supplying (inter-application processes) than tenders for bids or electronic purchases (inter-personal processes). It is now time to quicken the pace and launch more detailed studies on the projects to be carried out jointly by Purchasing and the ISD. This is almost certainly one of the major challenges that large corporations will have to face in the coming months.

4.4.3.2 Health, a new challenge?

A project of potentially large-scale proportions is underway in France — the Réseau Santé Social (Social Health Network), RSS for short.

The RSS aims to link together 400,000 health professionals in France. It is based on an Intranet infrastructure, i.e. a private, secure network dedicated to health professionals. It uses Internet technologies, and at the end of 1997, Cegetel was appointed to manager and run the network.

Given the very large number of health professionals in France, link up to the RSS will be gradual, reaching complete coverage during 1999.

The RSS illustrates the phenomenon of a community of interests which will undoubtedly be a key driver of growth in electronic commerce. It will enable four types of complementary players to gradually work together on the same media:

- health professionals, linked together through individual access points (IAPs) over the telephone network;
- health establishments, linked via collective access points (CAPs), using ISDN or permanent leased lines;
- health and social institutions which also use PACs, and exchange information from the previous two categories whose electronic health records (EHR) are stored on servers linked to the RSS infrastructure;
- medical service suppliers, linked through server connections points (SCPs), offering special services to health professionals.

All RSS users can access the Internet via a secure gateway (PRI) to seek additional information.

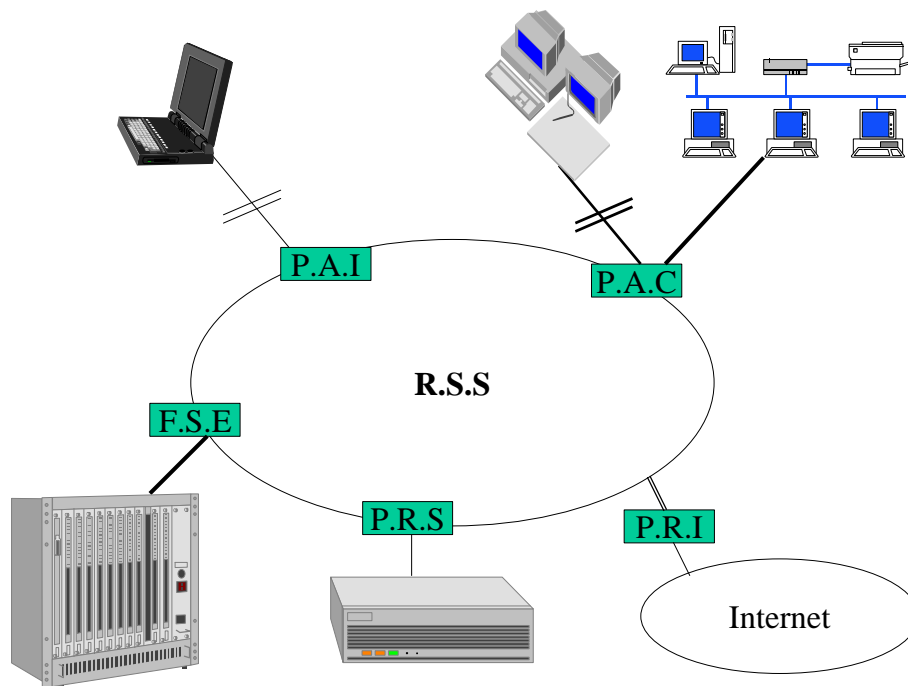


Diagram of the Réseau Santé Social/Social Health Network.

In addition to exchanging documents such as the electronic care sheets which will help self-finance the project, online health services will certainly emerge, tailored to the people's needs and solvency levels. They will include:

- access to specialized data banks;
- diagnostic and decision aid;
- access to professional directories;
- continuous training of medical staff;
- promotion of new drugs by pharmaceutical labs;
- tele-medicine or tele-assistance for less-known conditions.

It can be seen that for all these applications, sharing information is the key creator of value.

Given the scale of health costs in developed countries, a number of online information service applications (paying or free of charge, per service or subscriber-based) will emerge in this field, and France is not alone in developing such projects.

For example, a pharmaceutical supplier such as Rhône-Poulenc Rorer is already developing a range of services in several countries, attempting to factor in the specifics of the local environment each time.

Online health has a promising future provided it can adapt to the situation in each country.

In the USA, where there is fierce competition between laboratories, Rhône-Poulenc Rorer has developed a customer support site for wholesalers, with the aim of providing them with full details about the composition of different drugs (with fuller information on the most recent products, which are by definition less well-known), their packaging, price, and ordering conditions. This site is regularly commented on by the wholesalers themselves, who gave the site a prize during their annual awards ceremony, and which should soon integrate tracking functions.

In Denmark, where the citizens are very keen on neighborhood services, Rhône-Poulenc Rorer has taken another approach, developing a service which operates as follows:

- listing of the Danish asthmatics and their characteristics (allergies, triggering threshold, etc.) via their association's server;
- daily display of information supplied by the Danish meteorological office on the pollen count at different locations across the country;
- cross-referencing of data by Rorer and the sending of preventive alerts by electronic message to all asthmatics with allergies likely to be activated by the day's pollen count.

This service is free of charge today. But it is easy enough to understand Rorer's interest in terms of renown and customer retention in such an operation.

There are many more possible examples, since those involved have boundless imaginations, and the available tools (Internet, Intranets, smart cards, electronic messaging and "push" services) make almost anything possible. It is up to each player to assemble the core competencies and marketing and computing skills needed to invent tomorrow's new services; the watchword is not enjoy yourself, but enable your customers to enjoy themselves...

This brings us to the most ambitious, and probably the most (re-)structuring aspect of electronic commerce: managing customer flows. We shall simply try to make the reader more aware of this dimension — it would be presumptuous to do more for such a vast subject.

4.5 Managing customer flows

Wal-Mart has developed flagship applications for logistics and datawarehousing.

Wal-Mart

Wal-Mart is today the leading chain store in the USA with more than US\$ 100 bn in sales, way ahead of Sears (with around US\$ 40 billion). In recent years, Wal-Mart's growth has been largely aided by information systems and integrated processes to improve the management of sales cycle, and especially of stocks and supplies.

Two of the Wal-Mart's applications are references today, and are key to the development of electronic commerce:

- datawarehouses;
- logistics.

Datawarehouses

Wal-Mart's datawarehouse increased in size from 7 to 24 terabytes in 1997, compared with Sears' evaluated 2.5 terabyte datawarehouse. In terms of computing power, this volume of data enables Wal-Mart to analyze the results of each store at the level of its most detailed transactions.

These results matched management expectations, since the system has risen from 100,000 queries in 1991 to 600,000 in 1997, and the number of actual users has risen from 200 to 4,000, covering virtually all buyers and all store managers.

Following this learning phase, Wal-Mart believes it has only just begun to understand customer preferences and the specific populations of each store.

The increase in available data, and the growing control of the system by the operational managers, will significantly boost pro-activeness in product mixes and promotions. Above all, Wal-Mart buyers will gradually be able to identify the categories of products frequently bought, enabling Wal-Mart to display these products on its shelves in the most attractive way. For example, if customers buying golf balls in one store are also good customers for sweat shirts, the store manager can take the necessary steps.

Logistics

In 1996, Wal-Mart took the initiative of setting up a brand new model of the logistics chain called CPFR (Collaborative Planning, Forecasting and Replenishment). This program is designed primarily to boost cooperation

with suppliers so as to better control stock replenishment. In this sense, CPFR is pushing beyond inter-applications processes for formalizing a certain number of transactions, since it is an interpersonal tool for helping in decision taking for distributors and the suppliers who must work together to define the precise terms of replenishment required.

Electronic commerce

In light of its achievements in analyzing its customers' preferences and controlling its logistics chain, it was unlikely that Wal-Mart would play second fiddle on the promising market of electronic commerce.

However, the chosen approach is highly pragmatic, with one intangible goal: knowing how to offer quality products at market prices, with delivery included.

Analysis of the first electronic sales generated by Wal-Mart reveals that the "cyber-customer" is different from the chain store customer, and that the best sales are currently in books, recordings and PCs. Which suggests that the datawarehouse mentioned above will provide specific help during the first years. Wal-Mart's main medium-term goal is to offer each Web surfer a personalized site matching their profile and previous purchases; in this way each customer will have the impression that the whole of Wal-Mart is paying attention to them and hence assumes an optimum buying mindset.

But in the short term, the main challenge will be delivery. Until now, best-seller products have come from the leisure and home equipment sector, i.e. non-perishables at a relatively high unit price. So in an effort to develop the capacity to ship products as basic as toothpaste at competitive prices, Wal-Mart is making a detailed evaluation of all possibilities, including the use of shippers such as UPS and Federal Express. It should soon be ready to utilize an application that works out the best-cost method and re-organizes the day's deliveries on this basis.

Time, after all, is money.

In France, large stores have also carried out several projects in these areas. Especially in datawarehousing, since stocks are on average larger than in the USA.

When driven by the shared resolve of General Management, Purchases, Logistics and ISD, these projects have achieved ROI in less than 12 months.

In sales, on the other hand, growth is still hobbled by two factors:

Packaging, delivery and one-to-one marketing are still obstacles.

- Packaging and delivery, especially since the number of staff involved in sales is far lower in France than in the USA; it will be necessary to beat a retreat from certain automation choices.
- One-to-one marketing, which offers products suited to the profile of an individual's consumption habits, touches closely on issues of individual freedom and the protection of personal data.

It would not be acceptable to imagine a major retailer using information, for example, on the number of bottles of alcohol purchased per month by a certain consumer to address him/her ad hoc special offer fliers, even electronically. Moreover, the analysis of checkout stubs could already achieve the same results, since 2/3 of French customer payments are by check or bank card, but retailers are careful not to use this information.

There are several possible tracks today:

Preserving anonymity

This choice must be available each time a customer so wishes. This means using datawarehouse software for interpreting collective or geographic patterns.

In this respect, one should not forget that part of the Minitel kiosk online services built their success on user anonymity. Cigref has discussed Internet-based kiosk solutions with France Télécom, which has started to set one up, with different service levels based on the service supplier's pricing policy. It is clear that apart from its interest for those reselling online information, the kiosk offers all the virtues of anonymity.

But another solution, with less historical echo, is now emerging: the rechargeable electronic wallet. Apart from questions of technology harmonization and home appliances, it is worth knowing the amount of money customers would be prepared to take from an electronic wallet. Intuition suggests that the threshold would be the amount at which you start thinking about paying by check or card, but there are no market surveys and feedback from experiments that give any certainty on this.

Boosting contact with customers

This is the exact opposite of the previous track, since it involves creating an "intimate" relationship between buyer and seller.

This approach derives from the fact that the rate of conversion of visits into actual orders on e-commerce sites is still too low and that (even more indicative), there is a non-negligible proportion of people who fill their virtual shopping carts but never go through the checkout. The figures for the experimental shopping center Surf and Buy opened by IBM France for

three months around Christmas 1997, are sufficiently eloquent, even though Surf and Buy is so far the best-operating shopping mall in France:

- Number of visits 185,000
- Number of visitors who go shopping 4,000 (2%)
- Number of firm orders 2,000 (1%)

Just imagine a French hypermarket on a Saturday afternoon with 98% of the customers walking around with their hands in their pockets and 50% of the carts packed to overflowing and left abandoned in the walkways, to appreciate the completely surrealistic and frustrating nature of the situation.

Combining call centers with e-commerce is emerging as a solution for closing a sale.

A solution is however emerging: coupling call centers with electronic commerce. It feeds on the one mass media that most consumers feel comfortable with: the telephone.

This solution already exists on some servers, and there has been an extraordinary increase in the rate of conversion of visits into firm orders. Why? Because when they order, most customers ask the following questions: Am I sure this is the product I need?

- Have I properly grasped all its characteristics?
- Can I know when it will be delivered, and fix a time or date that suits me?
- What will happen if I suddenly cannot be there on delivery day?
- Can I trust their security system to keep my bank card number secret?

Very few applications can so far satisfy the requirements of potential customers. However, for a salesperson, this is known as closing the sale.

Which is why telephone call-back buttons are beginning to embellish e-commerce sites, mainly in the USA. This opens up undreamed-of possibilities for boosting sales, but also presents a major challenge for Information Systems Divisions.

- Web servers must be capable of recording each step of the user's browsing sequence before they decide to contact a tele-operator, interpreting it and providing a summary of the results on the seller's screen.
- Call centers on the other hand should be capable of routing calls to the most suitable tele-vendor (in terms of product or customer knowledge), and checking regularly on the validity of this profile by measuring actual performance in closing.

- Information systems, finally, should be capable of finding the customer data sheet (and its past transactions) immediately their identity has been revealed, and empower the vendor to accept ad hoc discounts on certain types of sales or to implement an internal assessment procedure without keeping the customer waiting. S/he also must have rapid access to information on stocks, shipments and delivery lead times.

The prospects are clearly very attractive, but bad taste is definitely out, since you only run the risk of chasing away the very customers you were trying to retain a little too energetically in the first place.

5 POSSIBLE DEVELOPMENTS

This is not an exercise in crystal ball gazing, but of providing an analytic grid of the possibilities so that anyone can grasp actual developments over the coming years.

We shall approach it along three dimensions:

The technology approach

Readers will have noticed that we did not give information about products available on the market. We decided that in this quicksand field where the product mortality rate equals that of infants, a Cigref type study would not be much use.

The strategies of players at work today should eventually lead to standards, whether *de jure* or *de facto*.

We feel that major **computing** giants like IBM, Microsoft and Sun will do anything to hold on to their strong position. But there are three other categories of players who will have a major impact in technology developments, since they are most capable of offering “global reach,” giving them a large enough user base to start speaking about a mass market and revolution in electronic commerce rather than simply evolution. These vital players are the **telecom operators**, the manufactures of the **electronic mass market**, and the large-scale **service providers**.

In fact, no one appears to have a winning deck, and we advise against following the strategies of isolated players; energies should be concentrated on **alliance strategies**, the only way to structure the market for technology products on a durable basis.

By these criteria, a credible alliance requires at least two “heavyweights” from two of the four sectors mentioned (computing, services, telecom operators, electronics) with a range of jointly-designed services.

The political approach

We have already seen that governments have high hopes for electronic commerce to stimulate growth and open up new markets, particularly the businesses of government members, without losing sovereign control over security national or tax control.

At the same time, there are a number of projects taking shape in public services such as customs and in services at the interface between public and private sectors such as health.

Only alliance strategies can structure the technology supply market.

Promising measures in this context include:

- the increasing number of digital procedures, electronic tenders, supply of online services by central or local administrations, even if the public accounts systems need to be adapted to factor in this phenomenon. In addition to their intrinsic productivity gains, these new methods also strongly stimulate SME-SMIs and households to start equipping themselves with the technology;
- a loud and intelligible statement that electronic commerce will not be taxed more heavily than other forms of commerce;
- recognizing digital signatures as a valid proof all over the European Union (this involves the technology constraint of harmonizing the public key infrastructure);
- updating certain EU directives on consumer protection, so that the consumer's country of residence will always be the country of reference for the law regulating that transaction;
- an effort to boost the spread of communication links between the different countries of the Union. A business in the EU that wishes to open a service for other Member States often finds it better to locate its site in the USA, the only country more or less well connected to every other...

The business approach

The revolution will only come about through investor determination.

This is to us the most promising approach since in the end what will make bring about a real revolution, rather than a mere evolution of current tendencies, is electronic commerce's capacity to attract entrepreneurs.

One can now see that mail order sales (in all developed countries) and telematics (in France) are evolutionary phenomena, since they are worth some 3% of the retail trade today, while an analysis of the articles that were published in the second half of the 1980s Minitel's potential shows that the promoters believed categorically that it was a real revolution.

Conversely, hypermarkets have netted from 2.5% to 25% of the retail trade in the past 25 years and seem to us to represent a genuine revolution in retailing, as was the appearance of the first large department in the second half of the 19th century.

Evolutionary retailing would therefore comprise a products and services package that meets the following criteria:

- more services;
- promotion and enhancement of product image;
- focused on consumer fads and fashions.

But a revolution cuts much further and deeper into consumer habits and provides the following benefits:

Lower prices

The euro and e-commerce will increase pressure on prices.

In this respect, electronic commerce has a number of assets since it can generate savings on other retail networks (agencies for example), and can benefit from the consumer aptitude to compare and negotiate prices. This capacity is likely to increase with arrival of the euro as a solid basis for comparison. But it also suffers from handicaps that information system divisions in particular must learn how to overcome: for example, managing transactions and goods flows, referred to in section 4 of this report.

An abundant, easy-to-understand product portfolio

For the first time, a mass media can offer personalized service: this is why e-commerce is so decisive.

Many products are already available on the Web, but the dominant feeling is chaos rather than abundance. Firms must therefore face the challenge of handling customer flows.

The ultimate goal is straightforward enough: every consumer will have PC mouse click access to every product in the world likely to interest them, and tomorrow's housewife of under 50 will have the same options via their TV remote control.

This solution is known as *one-to-one marketing*. Implementing it will involve far-reaching cross-functional changes in the businesses that opt for it, yet everything suggests that it is well worth the effort.

We shall probably also see the rapid development of "virtual" where Internet surfers can stop and shop from among hundreds of millions of product references.

Those positioning on this new niche are services already much in demand such as Internet portals like Yahoo, Amazon and Netscape. They possibly point forward to a future category of shopping centers.

Lifestyle-compliant access to products and services

And how will you prepare it in future?

Each period has had its own typical shop and priority access method. The 19th century had large stores and trains. The 20th has had hypermarkets and cars. The 21st century's mode of access is already with us — the Internet, provided that it becomes the universal information platform. Will the typical form of trading be electronic commerce?

Large French corporations have plenty of projects in this field, but seriously hope that this report will stimulate other key players to join them in this long-term approach.

After all, the future is only what people make of it...

***APPENDIX 1: LIST OF THE 20 SERVICES
MENTIONED IN THIS REPORT***

BUSINESS-TO-BUSINESS:

www.cisco.com: online sale and support of network connection equipment. A must.

www.dell.com: online sale of Dell PCs. Usually considered critical to the success of the Texas-based manufacturer.

www.tpn.geis.com: an electronic tender and procurement system, already used by several branches of General Electric. Also offered commercially to third parties wishing to use the same system as General Electric.

www.fastparts.com: spot market for electronic components. Very detailed information on prices and market mechanisms implemented, including support from an intermediary.

www.plasticsnet.com: virtual marketplace for plastics.

www.shopper.com: shopping mall listing a million prices for 100,000 computing and communication products.

CONSUMER GOODS:

www.wal-mart.com: the virtual Wal-Mart Store. See also the description of the Retail Link service on www.retailtech.com for electronic commerce between Wal-Mart and its suppliers.

www.fnac.fr: sale of leisure products. One of the French sites with the most ambitious electronic commerce scheme, with over 400,000 references.

www.auchan.fr: one of the first retail sites to have authorized secure online transactions. Very explanatory site.

TRANSPORT AND TOURISM:

www.fedex.com: the “global” site of one of the real leaders in international express shipments, which wagered early on the growth of electronic commerce.

www.sncf.fr: the French railways site, now accessible via the Internet, not only for timetables and prices, but also reservations.

www.michelin-travel.com: an example of a site providing a rich document base and Web interfacing to provide an interactive service with real added value. Several access (professionals, individuals) and invoicing methods.

www.degriftour.fr: one of the pioneers in electronic commerce operating only via electronic networks since 1990.

HEALTH:

www.cegetel.rss.fr: the official RSS (French health network) site set to gradually replace traditional information channels between French health professionals and also between professionals and their patients.

www.rpr.custservices.com: one of Rhône-Poulenc Rorer's two services mentioned in the report (the other is only available in Danish). This site won an award in the USA for its service quality to medical drug wholesalers, who are system customers.

FINANCIAL SERVICES:

www.wellsfargo.com: the site for Wells Fargo home banking. Offers an interesting range of financial products and features an attractive choice of access terminals.

www.bancopc.ccf.fr: the first French home banking site opened (end 1997) featuring high-performance Internet security procedures.

www.transat.tm.fr: the highly user friendly site of Banque Transatlantique, focused on services for expatriate customers

www.insweb.com: a shopping gallery specialized in insurance (vehicle, home, life, etc). Internet surfers can receive 20 broker offers per product on a 24 hour basis.

PAYMENT SERVICES:

www.kleline.com: the site of a French pioneer in secure online payments. Also covers the electronic purse market.

www.lekiosque.net: an other payment model from France Télécom, directly inspired by the Minitel kiosk format experience: no subscription and consumer prices varying by service level, a proportion of which is paid to service suppliers.

***APPENDIX 2: LIST OF 20 INFORMATION
SOURCES OF REFERENCE***

INSTITUTIONAL SITES:

www.finances.gouv.fr: the official French Ministry for the Economy and Finance site, also featuring related Industry and Telecommunications departments. Contains all reference data on the legislative aspects of e-commerce security and taxation, together with a number of analyses of the impact of electronic commerce on the French economy.

www.art-telecom.fr: an addition to the preceding site, the official site of the French Telecommunications Regulatory Authority.

www.ispo.cec.be: the information society site administered by the European Commission.

www.oecd.org: the OECD site. Due to its twin technical and economic vision, this is one of the key ideas centers for electronic commerce.

www.iaconline.org: the site for the Industry Advisory Council, the link between the US high tech industry and Federal government.

INTEREST GROUPS:

www.commerce.net: one of the major promoters of electronic commerce world-wide.

www.edifrance.asso.fr: the site of the Edifrance association, increasingly focused on electronic commerce between enterprises.

www.jurisva.com/ialta/: the Comité Ialta site, a group specialized in security and legal aspects.

www.e-comm.fr: site of the French e-Comm consortium, supported by such large corporations as Visa, Société Générale, BNP, Crédit Lyonnais, Gemplus, and France Télécom, and which contains references to on-line payments.

www.europayfrance.fr: a site containing the main information on the Cybercard project competing with e-Comm until the two consortia stated they were to merge.

MEDIA:

www.ebusiness.org: the site of the French E-Business publication. A mine of information, and even more for subscribers.

www.info-strategy.com: published by The Economist and focused on the competitive advantage of information systems.

www.businessweek.com: widely read by US managers. Gives the state of play of electronic commerce in the USA, and regularly publishes rankings and surveys.

www.ftmedia.com: the Financial Times online, giving information on information technology and communication.

DIRECTORIES - SITE LIST:

www.netb2b.com: Every year publishes a list of the 200 best sites for business to business electronic commerce.

china.si.umich.edu/telecom/telecom-info.html: the most up to date lists of communication service suppliers world-wide. Non profit.

ANALYSTS / CONSULTANCIES:

www.idc.com: one of the consultancies that has published the most multi-client studies on information and communication technologies.

www.metagroup.com: the Meta Group site. Analysts renowned for the relevance for their studies of new technologies.

www.gigaweb.com: the Giga Information Group site. The firm organizes a major "Business On Line" conference for various players every year in a European capital.

www.zonaresearch.com: a US firm closely monitoring Internet trends and putting them into perspective for customers.

***APPENDIX 3: LIST OF 20 TERMS WORTH
REMEMBERING***

B-to-B / B-to-C: **B-to-B** (business-to-business) covers sales between businesses. Payment is rarely made on ordering or delivery, but after the traditional style invoicing process. However, purchasing cards are now being offered by banks to enable online payment in this type of market. Conversely, **B-to-C** (business-to-consumer), or mass market, is usually linked to the concept of online payments and secure transactions, except for subscriber services of course. While it is handy to segment electronic commerce into slices when making five-year forecasts as pie charts or other diagrams, the “ v. *business-to-consumer*” debate does not appear to offer a very useful model of what is at stake. For example, what type of beast is an online service for ordering cars – is it mass market, since anyone can order a personalized car? Or is it business-to-business, since the auto maker will have to order a number of parts from its own suppliers to satisfy the order, and connect up with the delivery service and even a financial service for a turnkey product?

BPR: Business Process Reengineering. This is the capacity to re-model a company along its core business lines. A major tool for improving the front office - back office relation, or implementing cross-functional projects.

Certification Authority (CA): A body trusted by one or more organizations to create, attribute and cancel or suspend public key certificates.

Datamining / datawarehouse: As the name suggests, the purpose of a datawarehouse is to store all the data that can help model the company’s business patterns. But since these warehouses are currently measured in terabytes, management needs to use special extraction techniques to analyze and use this information effectively. If well parameterized and updated, a datawarehouse is one of the most powerful tools on the market for understanding and anticipating customer behavior.

DES (*Data Encryption Standard*): Encryption standard.

EDI: Electronic Data Interchange. One of the forms of b-to-b electronic commerce, used both for managing orders and for invoicing and customs clearance. Usually implemented within a sectoral community. Has experienced newfound youth with the arrival of the Internet which has lowered the entry barriers for this already old technology.

Electronic commerce / E-Business: In its narrow meaning, electronic commerce covers electronic transactions on the Internet. It increasingly includes VANs (such as EDI), and trading services where the aim is to provide value-added information. This why the term E-Business is gradually replacing E-Commerce, which is being kept for online payments. Customer support or goods tracking services also tend to be assimilated to E-Business, as do inquiries on flight times and available seats. Is the Minitel 3615 service also electronic commerce? Yes, but most foreigners don’t know about Minitel...

EMV: Since 1993, Europay, Mastercard and Visa have jointly defined the minimal standards of worldwide interoperability for smart-card based payment systems, now the international standard for smart cards. These specifications derive from ISO standards for microprocessor-enabled cards and payment card readers and are known as the EMV standard (Europay, Mastercard, Visa).

Encryption / Cryptography / Public key / Private key: Encryption (or cryptography) is the process of transforming intelligible information into unintelligible information by using secret agreements with a reversible effect. In France and several other countries, encryption is considered as military technology. There are two possible types of encryption, either

symmetrical i.e. sender and receiver use the same key, or asymmetrical, i.e. using a public key and a private key. Each player holds a “bi-key” comprising a public key and its associated private key. The sender transmits his public key to the receiver, but keeps his private key to himself... hence the name. A private or public key-encrypted message cannot be decoded by the other key in question (i.e. private or public). If receiver B uses A’s public key to encode a message and sends it to A, only A can decode it with the private key that only he holds. This ensures that the message remains private. If A encodes the data with his private key and sends it to B together with his public key, B can then decode it: this allows B to ensure the authenticity of the origin of the data, since only A could have encoded it with his private key (and therefore the data does not come from a hacker pretending to be A). **RSA** is one of the most widespread systems for asymmetrical encryption.

Escrow agency: The body handling the secret agreements on behalf of someone else as part of a privacy service. According to French law, a strong encryption service is free in so far as the user utilizes a cryptographic device that satisfies the principle of the prior depositing of the key with the escrow agency. The escrow agency delivers private keys to the user and receives a copy of this key when it is generated, and keeps a copy in case a legal interception or search is required.

Front-office / Back-office: These refer respectively to the (computing or other) systems at the interface with the end customer, and those at one remove from them. This definition is simple, but also slightly simplistic, since the line between the two offices is shifting as time goes on and may disappear altogether as business migrates towards a customer-oriented information system. For example, you might generally refer to a database that stores invoicing information as a “*back office*” application. But is it still *back-office* when, linked up with *datamining* tools, it turns into a powerful tool for analyzing the behavior of the customer base, and influences the company’s whole marketing policy?

Integrators: Turnkey logistics or transport services. Especially on the B-to-B market. The leaders are DHL, UPS and Federal Express.

Intranet / Extranet: Infrastructures for communicating and sharing information, based directly on Internet technologies and standards. **Intranets** are for a company’s internal users, whereas **extranets** link companies to their key external partners. The “being introduced in the French health sector is an example of an extranet. Another is the system linking equipment makers to their main distributors.

OBI: Open Buying over the Internet. Set of standards recommended by major US industrial players, and adopted by US government for developing the electronic commerce between the federal administration and businesses.

One-to-one: For marketing techniques in which customers can speak directly to a specific customer advisor. Today, this is considered as one of the most promising ways forward for mass market electronic commerce. By virtue of its high interactivity, it could become the first media to successfully combine mass market conditions with personalized service.

PGP: Pretty Good Privacy. An encoding algorithm freely available on the Web, and reputed to be unbreakable with current techniques. Forbidden in France.

SCPP (Smart Card Payment Protocol): Very lite version of SET, currently being tested in the UK.

SET / C-SET / E-COMM: SET (*Secure Electronic Transaction*), a protocol developed jointly by Visa, MasterCard and EuroPay to ensure secure Internet purchases using a basic bank card (magnetic strip). A customer makes an order from the supplier, sending its coded credit card number; the supplier adds its (equally coded) bank account number to the order, and sends the whole thing to its bank. The supplier's bank carries out the transaction with the customer's bank, informs the supplier that the transaction has been completed, and the supplier can then supply its customer. Everyone more or less agrees that SET does not in itself offer enough security, mainly because it cannot prevent the misuse of customer identity; the global spread of smart cards offers far better prospects in this area. France has a proven track record in smart cards and is carrying out two related projects—C-SET and e-Comm. In the C-SET project, purchasing is rendered secure through the smart card which handles the security system. The messages and protocols are functionally equivalent to SET, but to include “card plus card reader” encryption-based security, each message has to be slightly modified. The gateway processes C-SET messages sent using a standard credit card and translates them into simple SET. The customer and trader software must be upgraded to become C-SET compliant. In the e-Comm project, the payment is made secure using SET for standard credit cards and a proprietary system for French smart cards using an unused field in SET messages. Traders can use SET compliant software, and customers need special software and the gateway must be e-Comm compatible. For French-internal payments, there are two methods of making them secure, one in the chip, and the other on the hard disc. These two projects are set to merge on the basis of shared specifications.

Shopping center (electronic): A web server which in exchange for payment references all commercial sites commercial connected by hyperlinks. Inside the center, the sites are often organized by specialty, and key-word indexing helps user searches.

SSL (Secure Socket Layer): An information communication protocol to ensure authentication, privacy and the integrity of data exchanged. SSL has been authorized in France since January 1997. Its main advantage is that it is integrated into Internet browser software, and enables credit card numbers to be encrypted on the network. But merchants cannot prevent fraudulent user identity, and nor can users prevent against the fraudulent use of their credit card number by an unscrupulous merchant (especially during international transactions, since electronic commerce is categorized with mail order sales in France). The SET protocol was developed specifically to prevent against this risk.

Trusted Third Party (TTP): A generic term for the body handing the encryption keys on behalf of its subscribers. The term TTP can cover Certification Authorities (CA), Recording Authorities (RA), Accreditation Authorities (AA) for the certification of public keys, or an escrow or recovery agency for handling privacy keys. A trusted third party can also add value like an electronic notary or an hour and date stamping authority. France has opted for a *trusted third party* to implement *encryption*.