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**BEYOND EDI:TOWARDS ELECTRONIC TRADING**

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## BEYOND EDI: TOWARDS ELECTRONIC TRADING

Being a new concept, it is not surprising that the expression "Electronic Data Interchange" that was coined only a few years ago, has different meanings under the pen of various authors.

Like a kitchen recipe, some consider certain ingredients to be absolutely compulsory to have real EDI while others don't even mention them but indicate instead different components of their own recipes

Some adopt a very large definition of EDI covering the transmission of all sorts of messages, whether inter-or intra-company, business, administrative, or technical documents, whether written data or design etc., as long as the transmission is electronically made. For these authors Electronic Fund transfer, Electronic Mail or even, in France, Minitel, should be considered as EDI.

Others, on the contrary, have a very restricted approach. For them only inter-company business transactions should be considered as EDI.

However, I am not here to act as a chef describing before a television camera the ingredients which are absolutely necessary to make a soufflé Grand Marnier. What I really intend to do is to explain to you that there are, in reality, many facets to EDI and that, depending on the form implemented, the benefits for the firms involved could be very different. To give you an example, the implications of EDI, both on the day to day management and on the long term strategy, could be quite different depending if the firm is sending data, receiving data, or both sending and receiving data.

It is generally recognized that EDI is an exchange of data **between the computers of two companies without manual intervention** (some say with "minimal" manual intervention)

To answer the question of what are the practical consequences of this exchange of data for the two companies concerned, we must, in my mind, analyze what happens before the computer of Company A has sent the data to the computer of Company B.

and

what happens after the computer of Company B has received the data from Company A.

The examination of this question is, in my view, essential, because the benefits that could be derived by a company using EDI depend largely on the way the data, being sent or being received, is integrated into the whole of its computer system.

There are two possibilities:

### Case 1.

Company A uses what could be called EDI typists, who read the data **from a paper document** and key them into the computer in order to transmit the information to Company B. In a more elaborate form the typists take the data from one machine and rekey them into the computer. On the other end, Company B does the reverse operation., but uses a printer to reconstitute Company A's original document.**on a piece of paper** that is then introduced, in the usual way, into its information process.

Let us, for instance, assume that the two companies are trading partners. They may transmit to each other information on pricing, purchasing, scheduling, inventory, payments etc. Let us suppose a purchase transaction where Company A is the buyer and Company B the seller.

The EDI typists in Company A receive from the warehouse, by internal mail, a paper document indicating that the inventory of such and such items, normally supplied by Company B, must be re-ordered. They type the information into the computer and send it to Company B.

Company B receives the purchase order on its computer, prints it and sends it, by the usual channels, to the relevant department.

This is what could be called EDI Am/Bm standing for Company A manual to Company B manual.

In my opinion there is not much difference if, in Company A, the data is sent as above, by one focal point for the whole company, or if each department keys separately the data and send it directly to its EDI correspondent. Likewise, the situation is more or less the same if the various departments concerned in Company B receive paper messages from one EDI focal point, or receive, directly on their screen, an EDI message from their correspondent .

In its practical implications such exchange between **computers** differs considerably from the following case where we have an exchange between **applications**.

### Case 2.

Company A generates, inside its computer, the data sent automatically to Company B Likewise, Company B, when receiving the data, does not print it on a paper document but uses computer program (s) to feed, without manual intervention, the appropriate application(s).

In our example Company A has a computer application for managing the movements of goods in the warehouse. As soon as the stocks of one particular item fall below a certain level, the program begins a re-ordering procedure and an EDI message is automatically generated and sent to Company B.

When receiving the message, Company B's computer directs it to the particular computer application organizing the deliveries.

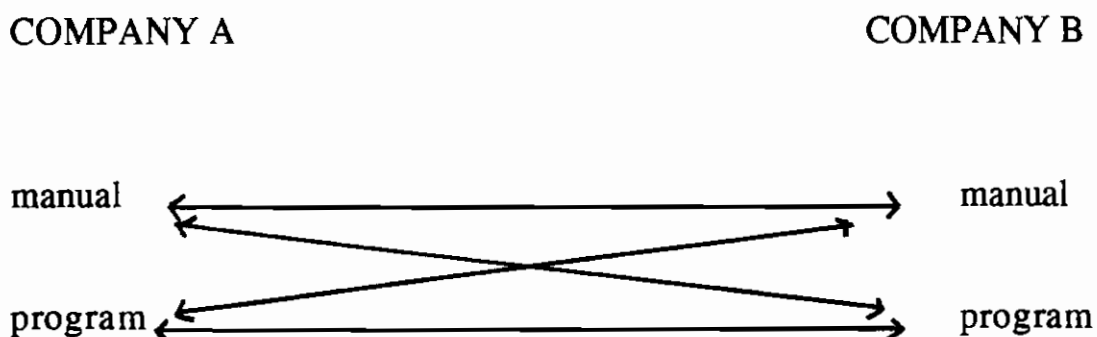
This could be called EDI Ap/Bp standing for Company A program to Company B program.

Of course, for each of these possibilities one could have, in theory, mixed cases such as:

Company A is keying while Company B introduces the data automatically via a program. This may then be called "EDI Am/Bp", for Company A manual to Company B program..Or EDI Bp/Am when the data goes back electronically from Company B to be received manually by Company A.

Company A is using a program while Company B is rekeying the data into its own system. We may then call it "EDI Ap/Bm", which stands for Company A program to Company B

manual. When Company B manually returns data to Company A which then enters directly into an application we have "EDI Bm/Ap".or Company B manual to Company A program.



We may also encounter a situation in which the sending company sends some data automatically by a program and keys other data manually into its computer. Similarly, in the receiving company, some data may be sent automatically by a program to one particular application but is also printed on a paper document to enter into other applications.

Now, after having reviewed the various ways data that could be sent by EDI between two companies, let us examine what are the implications for each of these cases on the day to day operations of both companies and investigate the benefits that each of them could derive from this new system of communication.

### **A.EDI manual to manual**

In the case of EDI m/m (manual to manual) the implications for the operations of both companies are rather limited.

Instead of sending a paper document by mail, Company A keys the data from the document and enters it into its own computer. The computer puts it into structured formats, sends it to Company B's computer, that prints the data on a paper which will circulate in the usual way.

Compared to sending paper documents by mail, the benefits are probably limited. The speed of transmission is increased and savings in mailing costs could probably be obtained by the company sending the data. But it does not simplify the way both companies work, neither does it minimize errors or delays, or reduce costs which are often presented as key benefits of EDI. On the other hand, the sender has to bear the extra cost of keying the data into its computer while the receiving company has to

meet such problems as the reliability of the message, the integrity of a digital signature and the legal authority of the data such received.

One may wonder how much paperwork is saved by this type of EDI. If two companies wish, for the first time, to transact in this way, they must undertake a series of time consuming formalities beforehand. Each prospective party in the transaction must first establish its bona fides and contract terms must be agreed beforehand stating exactly how the transaction will take place.

The trouble and extra cost of such a manual to manual exchange of data probably outweigh the benefits. Introducing this type of EDI is likely not to worth the trouble, except if it should be considered as a preliminary stage, in anticipation of a stable and more elaborate form of cooperation.

In a more advanced form of manual to manual EDI the data is keyed directly into the computer by the department concerned in Company A, and received directly on to the screen of the relevant department in Company B. In this case the advantages could indeed be significant for day-to-day management but, are not likely, on the other hand, to influence the long term strategy of the firm.

### **B EDI program to manual (or manual to program)**

If the EDI exchange that has been set up between the two companies takes the form of program to manual (p/m) or manual to program (m/p) we probably face a situation where a company has developed an EDI system to its own advantage and has imposed it on its trading partners.

It happens when a company informs its suppliers that EDI is a prerequisite for future contracts and leave them little option but to adopt EDI or to forego its business. Generally the latter firms are small businesses and their returns don't often justify the outlay needed to integrate EDI into their own applications. Consequently, these suppliers simply adopt EDI, at an extra cost, to retain their biggest customers, but don't bother integrating it.

This is the case, for instance, when a textile manufacturer develops an EDI system where the orders sent by his retailers enter electronically into his own manufacturing and storage applications and the deliveries are notified electronically to the shops. Normally he is not much concerned about the way these orders are introduced by the retailer, manually or electronically, neither does he care whether or not the retailer uses the information received about the delivery to update automatically his inventory.

### C. EDI program to program

Indeed the full advantages of Electronic Interchange can be fully obtained when EDI takes the form of a Program to Program( p/p) system, where the data is exchanged, without manual intervention, directly between the applications of both trading partners. In my view, achieving such **integration between applications** should, whenever possible, be the ultimate aim of companies entering into an EDI system. We then have what is sometimes referred to as **ELECTRONIC TRADING**.

To reach this stage of productive interchange, the data must be formatted in order to be immediately processable as such in both companies. It must be in a form that does not, in any way, need manual interpretation by the sender or by the receiver but should be able to immediately be recognized and treated when interfaced with the relevant application.

For these companies, less paper is a side benefit of EDI, which finds its justification on different grounds. "Paperless Trading", as EDI is often called, is therefore, to me, a wrong qualification as it inappropriately reflects the real economic value sought in implementing such system.

Indeed, EDI is not only a new way to dispatch documents or data from one company to another, but should, on the longer term, become a modern tool to increase the productivity of both partners, by linking together their applications, thus enabling them to trade electronically. The finality of **ELECTRONIC TRADING** is to optimize the efficiency of each partner's information system and there is consequently not much sense in resorting to it if **BOTH** partners are not already fully using, within their own companies, the various potentialities permitted by computer technology.

Let us take again the example of a textile manufacturer electronically receiving orders from retailers and electronically sending them delivery notes. The system would probably be more advantageous to both parties if, on the retailers side, the orders are no longer introduced manually but are directly compiled from the daily sales as recorded in the cash registers.

For the retailer the advantage is to have an automatic and immediate replenishment of his shelves while, at the same time, registering a considerable reduction in the level of his inventory by introducing "just in time".

The manufacturer is also benefitting, as it allows him to instantly adapt his production to the variation of demand by the final consumer.



Interfacing the computer applications of both partners is therefore the essence of ELECTRONIC TRADING. The idea is to direct data sent by an outside company, directly and without manual treatment or control, into the various internal files located in one's own computer, whether customers files, commodities, tariffs etc...thus providing the opportunity to use this data for applications such as orders received, dispatch notas, invoicing etc...

In practice, to reach maximum efficiency, the setting up of such ELECTRONIC TRADING form of EDI between two partners will involve a complete re-examination of the various applications used by both companies. It also entails a complete redesign of work processes. Laying EDI on top of existing work processes is certainly to be avoided, if one wishes to integrate this new technology effectively into the organization. In addition, it could also require, in many cases, the premature writing-off of considerable hardware investments.

This, however, is the price to pay to fully interface the maximum number of applications so as to eliminate further costs of recapture and manual treatment of data, thus bringing about the automation of as many as possible routine administrative tasks and allowing for a reduction in the number of employees and middle management.

Turning now to the impact of EDI on the way business is, or will in future, be conducted in an EDI company, we have already said that it differs according to the type of EDI which is implemented. Indeed, many of the changes listed below in the way business could be conducted in an EDI environment will, in fact, only occur if the two companies enter into a Program to Program form of EDI.

Without pretending to be exhaustive, we shall now enumerate some of these changes that will give new opportunities to EDI companies. In doing this we have particularly in mind large manufacturing and commercial companies and not smaller firms and service companies, as their structure and strategy could be considerably different from the rather stereotypes described below. We shall also leave aside the societal impacts of EDI, which could be the subject of another examination.

Several of these changes do not, in fact, result from the introduction of EDI per se but from the network integration that is a pre-requisite to EDI and more particularly to its ELECTRONIC TRADING form.

**Enterprise networking** means linking all the computer equipment and applications, allowing the organization to exchange digitized text, data, graphics or images electronically with anyone inside or outside the organization. Such an automated information system shared, by two or more companies, is sometimes referred to as an **Inter-Organizational System (I.O.S)**

Although the enterprise-wide information system that can be set up with the help of a network could make use of several new technologies, EDI is certainly one of the more important of them and it is therefore appropriate to ascribe to it the various long term advantages that a firm could obtain from networking.

### **EDI and Corporate Strategy.**

In an EDI environment the relevance of the company's objective should be re-examined. The first questions that a manager must ask himself are thus: Is the way my company intends to position itself on the market still valid? Is the product that I put on the market and the way it is distributed still appropriate? Is the geographical area in which I traditionally sell still my best market or should I extend it to other areas, taking into considerations the telecommunications facilities?

An EDI a company could locate the headquarters of its activities very far from its traditional markets. EDI also allows the company to split itself geographically by locating its various departments in different countries, far apart from each other. Should I take this opportunity and review my organization? For a multinational, for example, should I still have a complete organization in each country or should I centralize all the various accounting activities of the different companies in one country only, their purchasing tasks in another etc...and link them with an EDI network?

If EDI allows the company to locate differently its own activities, it also gives it an opportunity to externalize certain functions to outside firms. Previously a company tended to entirely control its activity by performing, by itself, all the necessary tasks involved. The more profound relationships that can now be held with outside firms, thanks to EDI, make it possible to maintain control of the activity while at the same time externalizing certain ancillary tasks.

Although indispensable, these ancillary tasks divert the attention of the management and staff from what is the real objective of the company and from the field in which management believe it can achieve excellence. These tasks could now be entrusted to outside firms, specializing in these aspects, and thus achieving higher productivity, as long as guarantees are

obtained that such relations are stable, on a long term basis, and profitable for both companies.

To make this possible it is essential that the flow of information is organized in such a way that it makes no difference if the company is performing the task itself or is externalizing it to others. Another condition is that the legal aspects of the association between the two companies are carefully examined to the satisfaction of both parties.

Partnership becomes therefore intimately linked with the strategy. In an EDI environment, a manager must constantly ask himself what line of business he should provide himself with and how he could leverage them through partnership.

Inside the company the internal structure should also be reshaped in the light of EDI. Should I keep my organigram as it is or organize the company differently? Does it make sense, in an EDI environment, to split the responsibilities the same way as before? Should my organization be made more flexible? Should it be adapted to take into account the change in the information flow resulting from EDI? Should I avail myself of the fact that EDI allows me to take full advantage of both centralization and decentralization and adopt a centralized-technology-driven system of control, leaving decisions decentralized?

Another consequence of the adoption of EDI by a company is certainly the way it has to re-organize the flow of information within its own structure.

Traditionally, the flow of information in a company is organized vertically, strictly following the lines of hierarchical authority. The request for information

Normally goes downwards and the response upwards. Upwards request is impossible and lateral request usually highly discouraged.

As a result of the re-organization of its flow, the information in an EDI environment is likely to be available freely and instantly in the organization, to all levels, and immediately reaching all locations. For example, team members unacquainted with each other can now be informed and communicate, even when they are geographically dispersed, thus enabling those with complementary skills to work together.

The changes introduced by EDI in the organization will probably reduce the number of people required, as certain layers of the organigram, particularly in middle management, could be suppressed. But the qualities required by the staff will also be different, as the role assigned to employees in an EDI environment will be considerably modified. The

middle-managers no longer collect information, monitor it, control it, amalgamate it or transmit it, in a processable form, to the executive suite. All this will now be accomplished automatically. Those middle-management positions that remain will be more technical and specialized, as their mission is now to put the system to work and to ensure that it functions smoothly.

Instead of routine work, the staff is now installing, coordinating and supervising the smooth functioning of the system. This, no longer, consists of a succession of administrative, individual tasks but involves intricate, multi-disciplinary work which requires different qualifications from the staff, with a particular accent on creativity and inspiration.

It also involves increasing the number of multi-functional teams, working as task-forces on specially assigned missions and reporting directly to the top management. These groups of people work together to solve a particular problem or define a new process and disband when the job is done.

As a consequence the style of management is also likely to be different in an EDI company. Indeed, the changes brought into the organization, the re-orientation of the flow of information, the flatter and leaner organigram, the shorter lines of reporting, the higher qualifications of the staff, the change in the responsibilities assigned to them, the encouragement of team work, etc...all this contributes to the necessity to change the style of management in an EDI company.

### **EDI and Business environment**

There are also questions to be raised as regards the way the company should aim to position itself in relation to customers and suppliers.

As regards customers EDI makes it possible not only to introduce new services on the market but also to "bundle" existing products or services with additional services that were either not possible previously or too expensive to offer without new means of telecommunication. This enables the company to foster a service-oriented image and enhance its role as industry leader in the application of technology. Thus EDI induces the firm to continuously innovate as competitors install similar capabilities, by constantly adding valuable features to its products or services .

The relations previously held with the company business partners will also be modified as a result of EDI. We have seen that when two companies wish to enter into trade relations via EDI they have to observe quite a number of formalities. The paperwork used in the full application of the negotiation process is expensive and time-consuming. It is therefore natural that such EDI exchanges could only be foreseen for

long term relationships and that off-purchases are excluded. The consequence is that an EDI company is likely to reduce the number of its suppliers and hold with each of them a more exclusive relationship.

The quality of this long term relationship will also be different. With EDI the policy of a company is no longer to pressure its suppliers to obtain the lowest possible prices but rather to carefully choose a trading partner that could be associated with its own activity. This new relation is based on trust, in a long term partnership, and no longer exclusively on short term price considerations.

The problem of who is likely to benefit most from this new relationship between buyer and seller is debatable. For a long time, the most significant advantage of EDI was the possibility for a company to obtain a competitive edge on the market, by using proprietary systems based on standards that were imposed to its partners. Now the evolution of widely accepted international standards makes it much more difficult to impose such proprietary systems.

It is however generally recognized that the buyer will be the dominant force behind the growth of EDI, because he will gain more immediate and measurable cost savings from EDI applications. The buyer could also gain a significant advantage by obtaining information about suppliers operations which could be a very useful asset when negotiating with the supplier.

This could well bring about a redefinition of the relations between buyers and sellers, particularly in the manufacturing sector, and generate new forms of organization of the production process. With EDI the dominant partner is in a position to assume the entire control of the production process by assuming the strategic functions and by organizing and monitoring the activity of the other companies that take part in the cycle.

## In Conclusion

We believe that the adoption of EDI by a company involves much more than deciding simply to collect and send data to and from other firms according to agreed standards as it it sometimes stated.

Sooner or later it will lead to an interface between the applications of the computer systems of the two companies This, in turn, will bring about considerable changes, not only in the day-to-day management of these companies but also in their strategic positioning, in their organization, both internal and external, and in the legal relationships that they hold with one another.

In other words, ladies and gentlemen, let me conclude by saying that EDI IS NOT JUST A TECHNOLOGY INVOLVING A DIFFERENT WAY OF EXCHANGING DATA IT WILL INEVITABLY LEAD TO A COMPLETELY DIFFERENT WAY OF DOING BUSINESS.

Personally I am convinced than this revolutionary character of EDI will be recognized in the years.to come. I thank you for your attention.

Namur, April 1991

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