

Electronic Data Interchange In The Automotive Industry In Morocco : Toward The Optimization Of Logistics Information Flows

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Abstract

The information systems conducted by the requirements of the internationalization of activities, by the organization of firms in networks and by the evolution of Information and Communication Technology, tend more and more toward the sharing of information in real time. The Electronic Data Interchange (EDI) is among the tools that guarantee this exchange. EDI is a quick and effective means of transfer of business documents and ensures the optimization of the information flows of and their synchronization with the physical flows in the Supply chain. The objective of this study is to answer this research question “how the automobile industry in Morocco uses the EDI technology to optimize its flows?” We chose to adopt a case study approach to observing the reality of the practice of the EDI and its use as a tool for optimizing information flows. Thus, this article is the result of literature review and of the content analysis of semi-structured interviews conducted with professionals in the automotive industry.

Keywords : EDI, Information flows, Automotive Industry, Supply chain, Logistic

Introduction

The evolution of technology and the structural changes in the global economy had led the organizations to recreate their value chain and to allocate more resources to the information system. Indeed, the emergence of their strategic and organizational role has made information technology investment an obligation and not an option. Thus, the information mastery that is an issue in the competitive struggle, the companies wishing to integrate distribution or supply networks into their logistic system, turn to

EDI (Electronic Data Interchange) which can extend the management of their physical value chain till the point of consumption of their product.

The automotive industry, because of its globalization, urges manufacturers to integrate their suppliers as quickly as possible, regardless of the country where they are: Eastern Europe, Morocco, Brazil, and China. It is essential that suppliers based in those regions can exchange EDI documents as simply as possible. ICT skills in the emerging markets or with low cost are generally limited, car manufacturers must ensure that they can provide the EDI tools which are easy to handle and which allow to even smaller providers to trade and communicate electronically.

This paper is the result of a review of the literature and an exploratory case study of the EDI in the automobile industry in Morocco. Its aim is to specify the relationship between the information technologies (IT) and flows logistics management; it relies on the managerial, organizational approaches in EDI in the automotive industry.

Presentation of the logistics function

The Logistic function is a crosscutting function which influences the performance of the whole company, in fact, the companies use the time as a strategic weapon to differentiate themselves from their competitors and the logistics are certainly plays an important role. This feature has long been regarded as a secondary function, its role has been handed in before for about thirty years, its mission is to optimize the whole stream physical and informational of the company and various organizations :

- Design the supply chains through which will circulate the physical flows ;
- Define and put in place the systems of information appropriately ;
- Build the necessary practical arrangements (physical facilities and associated business rules) and ensure its functioning.

In other words, logistics is to provide what is needed, where it's needed and when needed. The objectives are simple in their statement but complex in their implementation: delivery within 24 hours of all customers, response maintenance teams in less than 4 hours, optimizing the distribution and availability at regional, national or international scale. The challenge of logistics is to optimize the flow in the production system for both the industry and the distribution and rationally coordinate these flows in the productive sector. It seeks to establish harmonization, synchronization, and acceleration of flows by a global management:

- Physical flows (raw materials, components, work in progress, finished products, packaging, and waste, corresponding to the return logistics);

- Information flows : EDI or RFID (Radio Frequency Identification), ECR (Efficient Consumer Response), SCM (Supply Chain Management).

Vallin (2003) explains that the research of relevant solutions to global logistic problems of a company leads among other things, the definition of information that feed its operations flows. From a logistical point of view, information flows are apprehended along with the physical flows. As customers place increasing attention to the reliability of the information and the ability for businesses to make this information available and useful.

Logistics is, therefore, to improve the flow over an extended chain or supply chain that goes from the supplier's supplier to the customer's customer. The logistics must thus ensure a dialogue with all internal and external partners of the company, to coordinate the operations on the materials, components, finished goods flow and the information flows. It is present in the different levels of the business, both at the operational level, for the management of the physical flow of goods, for example, at the tactical level organizations to define and manage these flows in the medium term and at the strategic level to define long-term guidelines.

The edi technology : concept and technical modalities

Definition of the concept of EDI, origin, and applications

EDI (Electronic Data Interchange) can be defined as the development, between companies and within companies or groups involved in a supply chain, of standardized scenarios of operations and information transfers using protocols, languages, communications standards or bar codes, etc., to achieve, monitor and control the transfer of goods with all their technical support (shipping and handling), commercial and financial realizing every time possible computers to computer data transfer. The development of EDI is the result of the noticed progress in information technology, telecommunications, and also the numerous standardization efforts: for example include the digitization of telecommunications, the development of value-added networks (VANs) or the Internet with their protocols, languages, and telecommunication standards, the bar code reading or symbolize in multiple dimensions.

EDI allows then the synchronization between the physical and the information flows. Indeed, when the goods are being shipped to the customer, it emits a flow of information with all the orders corresponding to the physical goods. That allows an effective matching between the physical and the information flows, and permits to its user to be competent and quick in Supply Chain Management. This new technology allows us to reveal the role of IT in the supply chain: the global supply chain cannot be efficient with any information system. With the implementation of appropriate solutions, EDI provides many opportunities to facilitate management and to

improve the productivity. In addition, this system can integrate a flow of permanent communication between suppliers, service providers and customers. Finally, it unifies all electronic communications into a single application and ensures sending and receiving email through a single point of connection.

The Historical background of EDI

The standardization and the evolution of EDI projects cannot be separated from the history of the technologies that it uses. We recall a few dates marking the history of EDI in the world:

1972: Beginning of the definition of a common language for EDI in North America

1985: Creation under the aegis of the United Nations UN-edi group to achieve the international standard for EDI.

1987: Adoption in Geneva of the standard ISO 9735 defining the EDIFACT EDI syntax rules for administration, commerce, and transport.

1988: Beginning of the EDI programs (Trade Electronic Data Interchange Systems) of the EEC

1989: Creation of EDIFRANCE within the AFNOR

1996: EDI benefits from the emergence of the internet to allow companies to respond to the requirements of partners in term of communication.

2001: AS communication standard is published by the Uniform Code Council. AS/2 provides encrypted data transmissions over the Internet.

2004: Wal-Mart began using AS/2 communication with its suppliers. Some other major retailers will follow, but many retailers continue to use NPV communication

Today: 90% of American companies use ANSI X12 or EDIFACT. The same importance is noticed for European companies.

Types of EDI

Internal EDI

The internal EDI or in the site is the implementation, in the company, of software material, and telecommunication as well as the skills needed to manage electronic exchange with partners. The undertaking concerned must first be provided with a translation platform: translator or EDI station with telecommunications management tools. Qualified staff is also essential to be able to configure and administer the translator and carry out programs of interfaces with the organization's ERP. In addition, some translation programs between the ERP pivots file and EDIFACT messages should be developed. Those programs are called mappings. And finally, the concerned company must subscribe to one or more telecommunications networks

whose choice is determined by the communication protocols used by the partners in the automobile, it is OFTP.

External EDI

The external EDI is outsourcing to a service provider the management of all the electronic exchanges. The service provider offers all the necessary tools to respond to the requirements of the client company partners (human skills, applications, hardware, telecommunications...). To select the outsourcer that offers the best service, the company must have a good appreciation of its EDI project and must achieve it with his service provider from start to finish. It must also have intern telecommunications systems for the exchange with EDI provider that generally offers EDI services on demand, charged on consumption. Among the models that allow outsourcing of EDI, SaaS model allows to adjust the costs to the level of use, its services are accessible remotely over the Internet and shared. The company is relieved of maintenance, operation, hosting and deployment of your electronic data interchange.

Web EDI

Web EDI is an application, available on the Internet offering to firms that do not have means to exchange EDI logistics and accounting data with partners. The Web EDI solution is the most cost today because it requires no investment or delay. It usually responds to SME/SMI needs but also some large companies because it's processing capabilities, message volumes, the frequency of exchanges and interfaces with internal applications are evolving rapidly. Some solutions can respond to the requirements of different industries: automotive, retail, aerospace.... EDI allows receiving programs and calls delivery from customers, to consult then after receiving an email alert, to print them and import them into its management's commercial applications. It also allows sending ship notices and invoices using a form or forms applications. The documents are automatically converted to EDI message. In addition, this solution allows editing barcode labels of different packaging, delivery notes, and invoices.

Technical conditions related to EDI

Communication between business partners via EDI can be done in five ways:

2.4.1. The supplier can connect to the client computer system with appropriate interfaces or the other way round: the car manufacturer's providers use this method in their close relationship with their client in synchronous production management.

2.4.2. Suppliers and customers can participate in the same value-added network (VAN). A dedicated server connects computer systems of both partners, manages the exchange and provision of additional services to suppliers and customers such as mailboxes, authentication partner, message integrity, non-repudiation, and confidentiality.

2.4.3. Different RVA can be connected together to exchange messages: relations of partners from different RVA offer less potential, but the message transfer is done. It is also possible to interconnect on different RVA to conduct research on electronic catalogs. The EANnet.fr system ensures this server interconnection and directed by Grenod EAN France used to interconnect French catalogs.

2.4.4. Some small suppliers or clients can be connected to an AVR via internet: They enter their information from HTML form and receive information from their network partners as HTML forms. Conversion operations are performed by a specialized server connected to Web EDI VAN.

2.4.5. EDI servers can belong to real "marketplaces" that offer to buyers and sellers of all kinds of benefits, in addition, to transferring EDI: multi-catalogs, auctions, reverse auctions, concurrent engineering, etc.

Practice of edi in the automotive industry in morocco

Automotive supply chain:

The automotive Supply Chain is segmented. Upstream manufacturers and OEM manufacturers have positioned suppliers of rank 1. These companies supply the main components or sub-systems for vehicles, such as suspension or gearbox. Then downstream, there are the suppliers of rank 2 who typically provide components to suppliers of rank 1, such as pumps the electric motors or bearings. Then, further downstream, we find suppliers rank 3 that give suppliers rank 2 of components ranging from media, joints through the components for machinery, etc. As rank 1 suppliers are very important for car manufacturers, they are usually situated near their factories to facilitate production processes in time. Rank 2 suppliers could be located around the world and companies in this industry are expected to have set up their production sites in countries with low labor costs. Besides these ranks, there are also suppliers of raw materials, especially steel, which deliver their products directly to car manufacturers. Downstream from OEM manufacturers, there are the third party logistics providers (3LP) that transport finished vehicles to storage space and distribution hubs worldwide. These vehicles are then shipped to timely dealer networks.

Methodology of the study

We chose to adopt a case study approach to observing practices and generate the professional opinion. The Moroccan subsidiary of a French brand car assembly plant was selected for the main case study because it was to be influenced by society mothers in computer technologies and standard exchange.

At first, a visit and semi-structured interviews of approximately 60 minutes with middle and senior management paid on production, logistics and IT, were conducted and analyzed later. They were followed by phone calls and e-trade for more information and clarification.

Interviews with the Deputy Head of the Technical Department and responsible supplier relationships the logistics responsible for this assembly plant allowed us to compare the standards and management practices between different automakers. We are particularly interested in exchanges EDI between that firm and its various suppliers rank 1. Content analysis of the interviews allowed us to reveal the reality of the practice of EDI, used as an optimization for logistics information flow tools with all the benefits.

Exploratory case study of the practice of EDI

This French brand car assembly plant practice EDI with its suppliers that are tier suppliers 1, they must meet a set of specifications that presents itself as a handbook summarizing all the criteria that the supplier must meet before starting to work with this factory. Among these criteria, a chapter is dedicated to EDI and EDI web that clearly explicit that the supplier must always use the EDI in its commercial transactions with the factory. Thus, before any exchange, the supplier must sign with the company an "inter-swap EDI," then he must obtain EDI approval of its information system. The EDI that manufacturer aims to be global for all industrial units of the company and for the entire corresponding supplier panel, regardless of the country whether in Europe, Africa or Asia. In fact, EDI used by the assembly plant is defined by the parent company in France, it is based on international norms and standards recommended by GALIA, the standard is used multi-sector international standard EDIFACT.

Operating principle

EDI allows the supplier to remove the firm and forward-delivery requests from the factory and sending ship notices and invoices at the factory. The connections are made through the communications network of the European automotive industry (ENX). The EDI architecture of this company is based on the host of the said society is a central service that provides EDI towards suppliers and industrial entities of the said company. At low volumes, the company offers the WEB EDI which is less restrictive

in terms of the implementation period. All costs related to the removal of the messages in the mailbox (BAL) the supplier are at his expense, provision of messages issued towards the host society is also the responsibility of the supplier.

Fashion Exchange

The exchanges are via a letterbox that EDI is a protected area and associated with the provider account and the facility code assigned by society. A single letter box EDI is sufficient to ensure the exchange of a supplier (vendor account and website code) with all industrial entities of society. The company's relationship with its suppliers can be synthesized in two steps:

- Provision delivery requests in the box supplier EDI letter factory lays delivery requests in the BAL EDI vendor on or before 5 am (time France), weekly or daily basis depending on the selected supply frequency.

- The Delivery Requests are made available in the BAL assigned to the supplier's manufacturing site to be agreed with the company. The supplier must integrate the data contained in the application delivery to its information system.

In an emergency, another procedure is provided. In fact, the Emergency and RAN Balance may be issued at any time of the day DELJIT D98B format. The supplier is responsible for the removal of her messages in her mailbox that EDI will be consulted according to the requirements defined by Renault. At the time of physical departure of parts of its site removal of its messages and not before, the Supplier sends the Shipping Notice (advise XP) to CSR. The supplier must ensure, with its EDI service provider, as setting its mailing system advise XP message makes possible receipt in the CSR, within a maximum of one hour.

Approvals EDI

Before any exchange, the supplier must sign with the company Inter-swap EDI. EDI to work with this company, the supplier must first create its box letter CSR EDI and EDI obtain approval of its information system. All materials needed for registration will be made available by the responsible EDI business of the company that will lead the EDI approval of the Supplier. The approval ends with the validation of documents and files sent by the supplier after the first actual shipping plant parts. It gives rise to a registration VP. Previously PV recipe in fitness tests will be issued. The certification tests are conducted in standard living conditions and use generic EDI messages (Plant Type, Reference Type, etc.) for all suppliers to be approved. It is imperative to integrate these test data to the information system to be approved.

Subscription to Web EDI suppliers

The provider has the option to use an alternative tool: the web EDI proposed by providers of IT services GALIA approved and society. Web EDI is used by a supplier when the volume of trade with the plant is small in volume and frequency. The settings are quite simple and the necessary training for the use of Web EDI tool is in the order of 4 hours/user. The training tool is recommended by the company. The use of EDI web requires access to the Internet, a browser software (standard in the PC) under Windows) and can be implemented quickly at a low cost. Obviously, all the costs of the use of EDI web are the responsibility of the Supplier. Web EDI allows to start in 15 days an exchange process with the factory, without going through the approval phase. Web EDI allows receiving the requests and deliveries that are addressed to reply through forms of shipping notices and invoices. Delivery notes and labels can be printed via a laser printer. Once the most suitable solution selected, the supplier must inform the Logistics Support EDI platform. The Web EDI provider is responsible for the technical part of the creation of the BAL by contacting the Platform Support Logistics EDI and looks back on the provider. In a case of malfunction, the supplier will have to contact his priority the providing service.

General Synthesis

All commercial data and information related to production are computerized; there are no papers that circulate between the factory and the other partners. EDI is a practice developed in this plant dependent of the French manufacturer and systems used are STANDARD "turnkey". Indeed, the adoption of EDI is a requirement for all Tier 1 suppliers who want to make a commercial partnership with the plant. Moreover, the company has several specific customized integrated ERP systems manufacturer; these systems will manage the flows of information between all the functions: Production, Logistics, Quality, and Finance.

Conclusion

Operated for over forty years, the Electronic Data Interchange allows companies to transmit information in an automated way: orders, shipping notices, invoices, shipping orders ... The advantage of the device highlights the reduction costs, data processing optimization and reliability of exchanges with the objectives 5 + 1 zeros: Paper 0, 0 error, 0 Delay, Stock 0, 0 Cost, 0 Neuron. In the automotive industry, manufacturers are committed to integrating suppliers as quickly as possible, regardless of the country where they are located. It is, therefore, essential that suppliers based in different

regions, even small ones, can exchange EDI documents as simply as possible.

In Morocco, while digital is increasingly present on a commercial, industrial and societal scale, businesses are impacted by the massive introduction of new technologies in the workplace. The large companies making use of EDI, that is generally imposed by the manufacturer (standard Turnkey), the tool ensures the optimization of logistics information flow between all the partners in the Supply Chain automobile. Finally, with the implementation of appropriate solutions, EDI offers many opportunities to facilitate management and improve productivity. In addition, this system can integrate a stream of ongoing communication between suppliers, service providers and customers. EDI unifies also, all electronic communications into a single application and ensures sending and receiving email through a single point of connection.

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