INFORMATION SYSTEM OF INTEGRATED LOGISTICS (ISIL)

Abdellatif Benabdelhafid

CERENE - University of Le Havre, France

Abstract: The objective of an Information System of Integrated Logistics (ISIL) is to contribute to integration at the conceptual level of all technical data related to a product throughout its life cycle. The concept used is the "Extended Enterprise". The ISIL involves the integration of information through the production, storage locations and transport. In this context we speak about "Extended", "communicating" or "split" Information System (EIS). The goal of integrated logistics is to achieve a complete model of EIS, formal and approved by all partners. We will consider the analysis led by three objectives: modeling of the product by all technical data related to it throughout its life cycle (PLM model), modeling of communication between the different components of the extended enterprise (EDI model), modeling the organizational goal (Org Model). We show in this article the importance of ISIL to optimize overall supply chain. We give some examples of industrial applications

Keywords: Supply chain management; Information System; Extended Enterprise; PLM; EDI.

1. Introduction

Today the number has largely replaced analog. The digital communication networks to share a broadband and better computers on the other hand, have allowed the system to ensure in real time on the field, the correct operation of the production process and management, increasingly complex and diverse. Information technology, properly grafted to the company, can meet the twin challenges of reliability and flexibility. These terms must be considered in the context of the extended enterprise sub-contractors and various intermediate logistics. The Science and Technology Information and Communication will gradually change the company and how to work within it and with its partners "outside" in a context of constant change and increased competition. It is in this competition that are the new key performance business (costs, value) that to remain competitive have enrolled in a process of continuous innovation in its technological dimensions, informational, functional, commercial and organizational all stages of the life cycle of products and production systems. The implementation of new organizations design and production induces profound changes in the exchange of information and knowledge between different actors (individual, group, service) internal and external (customer, supplier, subcontractor, ...) and more generally the problem of capitalization and reuse of knowledge and practices and cooperation between actors (resource sharing, Risk management, social and economic co-design ...). These issues are central concerns of researchers in Integrated Logistics and lead them to propose new models of representation and specification.

The control and steering of any supply chain requires the use of tools both for managing the physical flow and the information flow. The production part is the subject of an

application of modeling and simulation to plan and schedule different tasks on resources. The constraints and the size of data to manipulate make the scheduling problem very difficult. The software is easily customizable simulation to simulate the behavior of a production unit. It is then necessary to design new systems simulation to describe the specific behavior of a production.
In a scheduling problem, multiple choice and decision are possible. The choices made or not satisfy the performance criteria. The criteria are reflected in general by the optimization or maximization of an objective function (minimization of cost, timeliness, maximization of profit, ...). The size of solutions, often exponentially, precludes the complete list of these. We must intelligently explore the solution space to find a good solution, not always the best. Several optimization methods are applied to scheduling problems, such as mathematical programming, dynamic programming, graphs, meta-heuristics. Our team focuses on meta-heuristics and especially genetic algorithms and a supply chain involving several actors who must collaborate for the proper functioning of the chain. The actors exchange information inside and outside of the chain. The traditional communication protocols are no longer valid. It is imperative exploit STIC (Science and Technology Information and Communication) to construct an adequate information system. The IDE for example, has begun its migration to the Internet. The language of XML documentation is used to translate EDI. It is a dynamic language less restrictive than its ancestor SGML. It helps define these specific tags and specify the document structure using the Internet.
The XML looks like the future of knowledge representation language it integrates the concepts of object modeling, present in UML. The development of XML requires a comprehensive study of object-oriented languages C + +, Java, Lisp, etc.. A summary of the concepts of these languages allow the enrichment of XML. It must also provide XML semantics necessary in some exchange of information, such as the EDT.
One objective of the Information System Integrated Logistics (ISIL) is to provide various partners across the extended enterprise collaborative and innovative environment for them to work together and share information about a product while at the same time throughout its life cycle, from conception to maintenance. The IS (Information System) of each industrial entity must take into account the breakup of other IS Extended Partners. The distribution and cooperation characterized and IT solutions for the extended enterprise.

2. Integrated logistics: an area of search for regional development

In our research on approaches, methods, concepts and tools for the design of Information Systems, Integrated Logistics, we are in a context of reorganization of industrial processes, where the information systems were the dominant medium. Our objective is the study of transport logistics systems by using the concept of Integrated Logistic Support (ILS).
The SLI is a very busy area in the references, standards, procedures ... difficult to use in practice and still poorly distributed. The logistic systems of transportation are both a subset of SLI, a subset of the design life cycle (concurrent engineering) and industrial sector to develop research as our theme.
Similar to the case in industry, transport illustrates well the concept of business network. For a transport company, it is integrating the management of freight and the fleet. Using the efficiency and productivity of the transport operating through the introduction and mastery of new technologies and EDI implementation of information system for transportation? "In the field of transportation, integrative approaches are now at their design phase, they are far from being passed into the public domain, where the public is offered" files "which juxtaposed presentations on various tools and services and just trying too often to develop an integrated

picture in the form of global system ... Every officer and decision-making must keep in mind that the full effectiveness of any solutions (tools and techniques) Telematics depends on its integration into a global scheme ... " .
In this context, and to answer the question posed by the integration of SI transport, our goal is to: develop, test, implement and validate a comprehensive approach to integrate various telematics tools that can be used to improve multimodal transport of goods through the use of new technologies for processing information (RTI, EDI, embedded systems ...).
"Today, the tools and means of communication are integral to the equipment in a port, as well as reception facilities for ships and equipment for cargo handling: the complexity of operations. The number of stakeholders, planning requirements makes it essential heavy use of new information technologies and communication»
The theme for this project is the modeling and management of a intelligent platform to the full chain of logistics and transportation in the area of Le Havre port using SLI. This platform will open and distributed architecture requires a communication system that meets the needs of all stakeholders in this chain. In its research and development team has already addressed ISIL and, therefore, has an experiment on a portion of the supply chain. Our knowledge has been acquired or reinforced through collaborations with industry and business, and by a research recognized by publication of theses and papers in various journals and conferences dedicated.
This team can rely on solid expertise in the areas of organization, planning and handling (labor organization, scheduling workshops, simulation). Our goals are to move towards a greater control of the supply chain by taking into account the entire flow (whether virtual or information such as real as it is material and goods).
Since we are interested in flux, it is also necessary to understand all the channels that represent the means employed to effect communications. We must therefore study the problems related to the emission, transmission, reception and interpretation of various streams.
The current development of computer models showed that systems are highly reactive. In these models, it is difficult to get an idea both simple and accurate global behavior. The many constraints of logistics systems require flexibility and adaptability to allow real-time reaction to events and an easy operating system.
Our work in this area led us to seek tools in the areas of distributed artificial intelligence and more specifically the use of distributed object systems. Indeed, the interest of these systems is to provide a local analysis and distributed solving problems. The overall objective is thus divided into a set of distinct behaviors. The designer focuses solely on the description of objects and the overall behavior of the system will be the result of interactions between these objects.
In a supply chain, we have identified the following objectives:

- Significant improvement in productivity.
- Optimization of logistic processes.
- Optimization of network transport services.
- Knowledge of real time system status.
- Quality assurance

The information available to the starting point of the supply chain, transmitted in real time, should benefit both to all players and allow optimization of resource management. In a supply chain must integrate more than one system information, fleet management, freight management and representation of the topology of the site. This management must be done in real time. Taking into account these points requires, for computer technology use distributed objects.

The validation of this research can be done using simulation techniques. In terms of issues and research findings, we develop a model for integrating the enterprise based on:

- Systems Data Management (PDM), with the development of a generic ontology and modeling objects for the standardization of data as support integrator. This integration involves the full life cycle of the product within the meaning of the Integrated Logistics,
- EDI (or Electronic Data Interchange) for communications with the environment (clients, subcontractors), with which the company is networked, the life cycle of the company,
- the use of middleware technologies for communication between technical applications within the enterprise,
- use techniques of expression and validation of time constraints.

3. Conclusion

The objective of an Information System of Integrated Logistics (ISIL), using the concept of "Extended Enterprise", is to contribute to integration at the conceptual level, of all technical data related to a product throughout its life cycle. The ISIL for global logistics and involves the integration of information means of production, storage locations and means of transport. In this context we speak of information system "extended", "communicating" or simply "split". It is designated by EIS

The goal of integrated logistics is to achieve a complete model of the EIS, formal and approved by all partners. To achieve this model, we consider the analysis led by three goals to derive constraints for development of the EIS:

- Modeling of the product by all technical data related to it throughout its life cycle.
- Modeling of communication between the various components of the extended enterprise.
- Modeling the organizational goal.

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